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July 1992

Volume 75, Number 7

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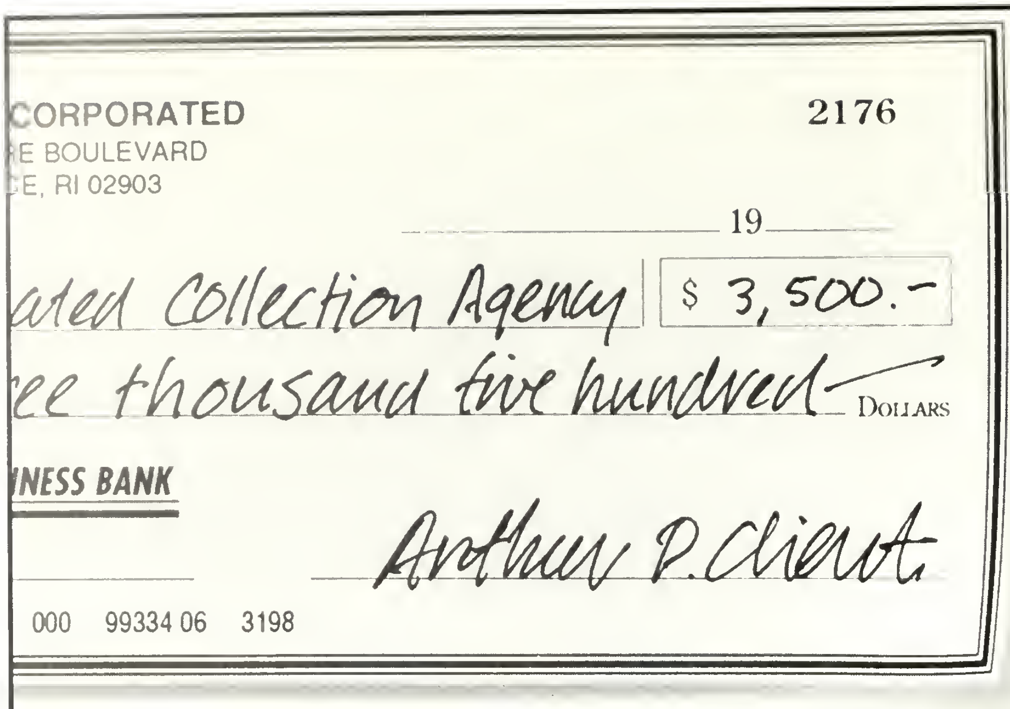
Medical Education in Rhode Island



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COMMENTARIES

Medical Education in Rhode Island

"Of making many books," said the Preacher, "there is no end, and much study is a weariness of the flesh." And yet we tirelessly persist. Medical education begins when we are young, persists through four difficult years of rigorous study, plods its way resolutely through three or more years of graduate education and then continues for most of us, unabated and unabashedly, until well beyond the customary threshold of retirement. The need to learn continues to be an indispensable part of medicine. This issue of *Rhode Island Medicine* is joyously dedicated to this persistent involvement in renewed learning.

Stephen R. Smith, MD, associate dean of medicine, provides a demographic synopsis of Brown University's 83 new physicians, the MD Class of 1992. Fred J. Schiffman, MD, describes the annual scientific meeting of the Rhode Island Chapter of the American College of Physicians and offers the abstracts of the 16 papers orally presented by resident physicians from the hospitals within Rhode Island. Stanley M. Aronson, MD, MPH, and colleagues present a profile of the 2,350 practicing physicians within the state. And Debra B. Abeshaus, the Women-in-Medicine Officer at the Brown University School of Medicine, summarizes the statistics regarding women in medicine in the current decade and addresses both the challenges and the resources available to them.

The editorial board of *Rhode Island Medicine* plans to assign a summer issue each year to a consideration of medical education in our state. In future years, particularly as the Department of Health's database becomes more enriched, we can offer an increasingly elaborate profile of our practicing physicians.

But What Shall We Call Thee?

After four years of rigorous study, punctuated by intervals of self-doubt and feelings of inadequacy, the 1992 seniors at Brown University's School of Medicine each have been awarded the MD diploma; suddenly there are 83 new physicians in the Ocean State. If their inner emotions were anything like those of their predecessors, they felt simultaneously ennobled and humbled; powerless, yet capable. To most of them, the graduation was an act of great transition, somewhat akin to an ordination. But whatever form their transformation assumed, they felt differently, acted differently – and were now to be called by a different title. Society has always recognized the need to confer special titles upon those assuming great responsibility.

It is not surprising that there have been varied ways of addressing members of a profession as old and diverse as medicine. Over the centuries many English words have been employed for this purpose – some in respect and some in derision. Of the more commonly encountered names, there are: "doctor," "physician," "clinician," and "practitioner" – and in colloquial speech salutations such as "medic," "doc," and even "leech." Each had its beginnings in some ancient setting with original meanings often far removed from their current connotation.

The word "doctor" for example, is from the Latin *docere*, to teach, and initially was applied to one who instructed in some branch of higher learning, typically theology. The learned authorities (Ambrose, Augustine, Gregory, Jerome) whose teaching constitute the major sources of guidance in early Christianity, still are referred to as doctors of the church. As a secular title, for one concerned with disease of the body, the earliest references to doctor date to the 14th century. Chaucer (1386) talks of " . . . a doctur of phesike." Today, many professions reserve the doctoral degrees for their highest levels of study. Beyond the ubiquitous doctor of philosophy degree, which is not assigned to any specific profession or calling, we now have numerous categories of doctors including D Pharm (pharmacists) DDS (dentists) DVM (veterinarians) DDiv (theologists), and *mirabile dictu* even JD (lawyers). Is there a doctor in the house? In our educated society, the answer is many.

Well, then, the title physician? This from a Greek word, *physic*, describing the natural sciences. Aristotle employed the word to embrace botany, zoology and geology. By the 13th century, a physic(k) was a practitioner of the healing arts. Lathan observed that "the practice of physic is jostled by quack on one side and by science on the other." By Shakespeare's time the word physic had evolved to the current word physician. (In Act V, Lady Macbeth's doctor says with perplexed sadness: "More needs she the divine than the physician." But her husband two scenes later uses the older term, "Throw physic to the dogs; I'll have none of it.") By the 16th century the physicians were divorced professionally from the surgeons, each having their individual guilds and domains of professional activity. The word "physick" continued to stand as the name of the profession, although it was sometimes amplified as "doctor of physick." During the 17th century, physick assumed a somewhat deviant meaning describing something inanimate with medicinal properties, often a purgative. In current usage, the term physics, (with the "s" now added) is narrowly defined as the study of dynamics of matter and energy (as distinguished from the life sciences). This is a recent coinage first employed in the 19th century. The word "physician" as found in the Bible (eg, "... Luke, the beloved physician") or in the first sentence of the Hippocratic Oath ("I swear by Apollo, physician . . .") represents contemporary translating of older terms.

Practitioner? It is derived from the word practice, the action, or procedure, of doing something, often habitually. Again, it originates in a Greek term that is the source for such cognate words as apraxia, praxis, and chiropractic. In British medicine, a practitioner is one who engages in both medicine and surgery. Oliver Wendell Holmes, himself a physician, once said: "The general practitioner had to recognize that people could get well, unpoisoned."

The word "clinic" (and "clinician") descends from a Greek stem meaning bed, and hence the original meaning of the clinician was one who treats bedridden patients. This Greek word has a more primitive meaning: to slope or slant, much as a bed might do, and is reflected in such current words as incline, isocline and recline. The word "clinic" now defines a place for the care of ambulatory patients (as distinguished from the hospital), a curious departure from its earlier inpatient meaning.

"Medic(o)" at first glance, seems to be a pejorative shortening, much like the word "doc." It is the name, in military language, given to the field physician or the corpsman. But it is a word that comes to us through the centuries virtually unchanged from its Latin ancestor, *medere*, to heal, and *medicus*, a physician. The name is preserved, essentially unaltered, in both Italian and Spanish. In 17th century England, a "medick" was a synonym for a physick.

Finally, the word "leech." It is used most commonly today to describe a tenacious, blood-sucking parasite – or a person with those characteristics. The aquatic worm, from the family *Hirudinea*, had been used by physicians for centuries for blood-letting purposes. The word is traced to a Middle English word, *leche*, meaning worm. There is a yet older Gothic word of similar sound, *lekeis*, which signified an exorcist or magician. The Old English word, *laece*, came to mean a practitioner of medicine; and by the 14th century, the term *leech* unambiguously denoted a physician, carrying with it no derogatory intent. The worm that he used for curative purposes, coincidentally, had a near identical name, but one with a different lexical ancestry. The two meanings, and spellings, fused somewhere in the last millennium.

A good name is certainly more precious than ointments and rather to be chosen than great riches. But whichever name or title suits each of these 83 new colleagues, may they bear it with honor and distinction. We wish them much joy in their new station and much success in their careers.

Stanley M. Aronson, MD

Let Not Thy Left Hand Know

A year ago, in the July 1991 issue of this journal, there appeared an editorial on the perils of left-handedness ("The Relative Survival of the Gauche, the Sinister and the Adroit"). The commentary defended the left-handers of the world while reflecting on the many biases and impediments established by the right-handed majority. Mechanical instruments were noted to be designed solely for the right-handed majority, with no recourse for the left-handed minority but to adapt; and our languages continue to reflect a relentless prejudice against the southpaws of the world. Since that time a number of earnest, population-based articles in the medical literature have suggested that right-handers live, on average, 9 years more than do left-handers and that "... left-handedness may indicate covert neuropathologic features. . ." In the interest of even-handedness, then, further commentary on this subject seems to be warranted.

Few things in life ever are distributed randomly. Were hand-laterality without biological advantage, for example, we confidently would expect ambidexterity to be an almost universal characteristic among humans, as it is in many lower primates. If, on the other hand, handedness per se does confer some advantage, then sinistrality and dextrality should be about the same in frequency. Yet right-handedness is the dominant form of laterality in every human society studied, regardless of whether the culture is advanced or primitive (although this right-handed dominance is more pronounced in the socially structured agrarian communities than in the nomadic hunter-gatherer societies). In one tangential reference the Bible notes that about 3% of a military unit are left-handed (Judges 20:15-16). There is no human society or major subdivision where left-handedness dominates, but there exist certain small domains where, while still in the minority, left-handedness is consistently more common than in the overall population. These "left-handed" enclaves include the epileptics, particularly those with seizure disorders of perinatal origin, and children with dyslexia or neurodevelopmental disorders. But left-handedness is also higher in those attending college than in those not challenged by higher education and some observers even find a positive statistical concordancy between high IQ scores and left-handedness; blonds of either gender are more likely to be left-handed than brunettes; and most strikingly, architects and trained musicians have substantially more left-handers in their midst than the 9% left-handedness found in the overall population. (This is despite the fact that most musical and drafting instruments are designed for right-handers. Have you ever witnessed a violin bowed by the left hand?) Since the right cerebral hemisphere is said to harbor the non-verbal, spatially oriented skills such as art and music, and since left-handers must perforce establish much of their motor control center in the contralateral (right) half of the higher brain, this correlation makes some superficial sense.

The chiral bias in favor of the right (*chiro*, from the Greek, pertaining to the hand; hence such words as chirurgeon and chiropractic), is not a universal happening. Newborns still prefer to enter this biased world from the left anterior occipital position (LOA). Organic compounds, such as the sugars, with their asymmetric molecular structures, are either right (*dextro-*) or left (*levo-*) oriented. In living animal tissue, however, virtually all of the metabolically active molecules are left-handed (ie, levorotatory) including the essential amino acids and DNA. Evolution has modified the sugar-splitting enzymes of the human enteric system to act only on the dextro forms, allowing the levo forms to remain metabolically inert, and thus passing through the gut with neither degradation or absorption. Industrial chemists have exploited this chiral difference in sugar molecules to provide us with numerous new non-caloric sweeteners. Changing the rotatory image of a molecule from left to right often changes more than its optical properties. The molecule of carvone ($C_{10}H_{14}O$), for example, yields the odor of spearmint when left-handed, and the odor of caraway seeds when right handed. Thalidomide is a useful tranquilizer in one configuration but a powerful and dangerous, mutagen in its mirror-image. Dihydroxyphenylalinine becomes effective in the therapy of Parkinson's disease only when its levo-rotatory isomer (L-dopa) is administered.

On a larger canvas, the American ship of state's rudder has been uniformly grasped by the right hand – until the present century. During the 19th century, only the 20th president, James Garfield, was resolutely a left-hander; and for reasons probably unrelated to his handedness, he was assassinated within months of his inauguration. During the 20th century, both Harry Truman and Gerald Ford were out-of-the-closet left-handers. (Ronald Reagan had been born left-handed, it is said, but was switched as a child.) The shift to the left is accelerating and the left-handers of this nation may now take pride in the virtually sure knowledge that the next President of the United States shall be left-handed. (H. Ross Perot, Bill Clinton and George Bush are each left-handed.)

Dextrality remains the statistically dominant form of hand-laterality; but in those truly vital forces within the compass of nature – from molecular biology to American politics – left-handedness is now emerging as the enduring way of life.

Stanley M. Aronson, MD

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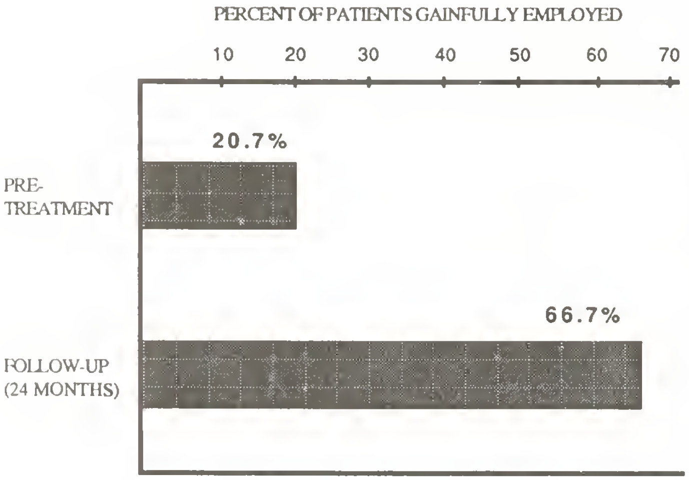

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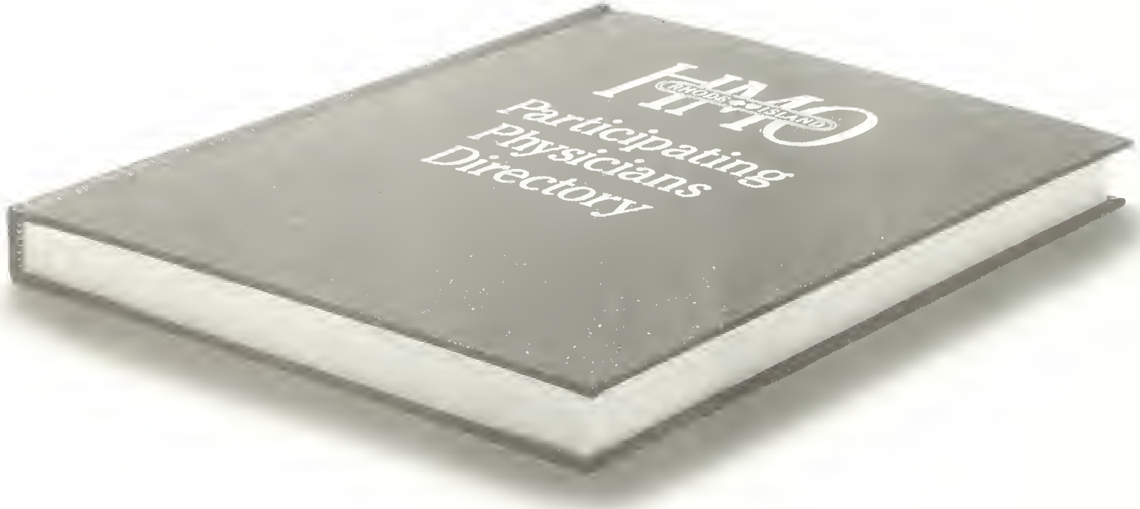

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The Brown University School of Medicine Class of 1992

Stephen R. Smith, MD

If this class follows the pattern of preceding classes, about 11% eventually will enter the practice of medicine in Rhode Island.

On May 25, 83 men and women received the Doctor of Medicine degree from Brown University. They represented the 17th class of physicians graduated from that institution in this century. If this class follows the pattern of preceding classes, about 11% eventually will enter the practice of medicine in Rhode Island. Of the 1,172 physician graduates of previous classes, 120 currently are licensed to practice in Rhode Island, excluding current interns and residents.

This article will introduce the graduates of the MD Class of 1992 to the physician community of Rhode Island, since many will be your future professional colleagues.

A Portrait of the Class of '92

Fifty-three graduates are men (63.9%) and 30 are women (36.1%), which is a departure from the more closely balanced classes of the past. This appears to be an aberration rather than any new pattern.

The racial/ethnic composition of the class, as shown in Table 1, shows less diversity than previous classes. Nearly 80% of the class is white. This is attributable mostly to the large proportion of this class that entered through the postbaccalaureate premedical admissions route, which is explained below.

More than one-quarter of the class are residents of Rhode Island (24 graduates representing 29% of the class). This percentage is somewhat higher than previous years where about one-quarter of the class claimed Rhode Island as their legal state of residence. The 24 Rhode Island students in this year's graduating class came from 13 different communities in the state: eight from Providence, three from Cranston, two each from Barrington and Warwick, and one each from Charlestown, Chepachet, East Greenwich, Pawtucket, Portsmouth, Tiverton, West Warwick, and Wickford. The high schools from which the students graduated also reflects this diversity, with three students having attended Bishop Hendricken, two from Barrington High School, and the rest having come from 19 different high schools.

The international student came from Turkey. The number of foreign students is likely to increase gradually since the medical school has gained international prominence in recent years.

The MD Class of 1992 represents a transitional class in terms of the routes of admission taken by its members. This class saw the last of the cohort of students admitted from the 7-year Medical Education Program (MEP). Nine of the graduates were MEP students. The 8-year Program in Liberal Medical Education (PLME) has replaced the MEP as the major route of admission, but the first cohort of PLME students is in the MD Class of 1993. Five PLME students who received special permission to accelerate their programs are graduates of this year's class.

The medical school entered into special agreements with four postbaccalaureate premedical programs (Bennington College, Brown University, Bryn Mawr College, and Columbia University) shortly after the PLME was inaugurated. Students from these programs would have decided upon a career in medicine only after completing undergraduate studies. Typically, they have been engaged in other careers for several years following college. The goals in establishing this new route of admission were to maintain a rich diversity in the student body by admitting students who were older and who had different academic and life experiences as well as rounding out the total class size to compensate for the expected attrition from the PLME contingent.

Postbaccalaureate students represent the plurality of students in this class (29 graduates, or 35%), a temporary situation that will change as larger numbers of PLME students are represented in subsequent classes. While postbaccalaureate students do add to the diversity of the class in terms of age and life experience, this

ABBREVIATIONS USED:

PLME: Program in Liberal Medical Education
MEP: Medical Education Program

Stephen R. Smith, MD, is Associate Dean of Medicine and Professor of Family Medicine, Brown University School of Medicine, Providence, Rhode Island.

route of admission has been singularly unsuccessful in attracting minority students, thus accounting for the lower than usual number of minority students among the graduates.

Traditionally admitted students from four-year undergraduate premedical programs account for 16 members of the class (19%).

Another 17 students (20.5%) were members of the Brown/Dartmouth Medical Program in which the students spend their first two years of medical school at Dartmouth before completing their last two years at Brown.

The remainder of the class was composed of one MD/PhD student and six students who were part of the Early Identification Program at Providence College, Tougaloo College, and Rhode Island College. These latter students were offered provisional admission to the medical school during their sophomore year of college at one of the three institutions.

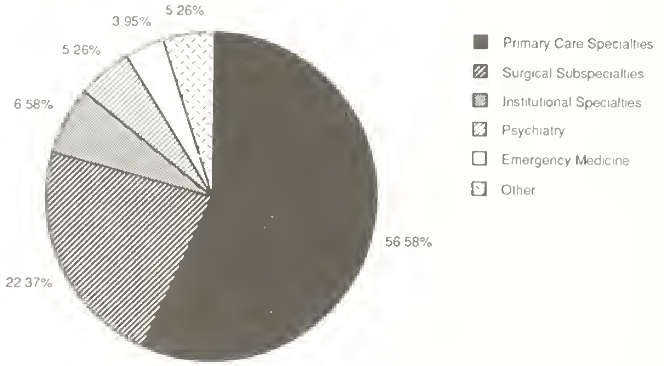
Brown University was the most frequent undergraduate college among the graduates, accounting for 36 graduates (43.4%). Providence College ranked second with three members of the Class of 1992. Altogether, the graduates of the Class of 1992 came from 41 different colleges and universities.

The most common undergraduate major among the class members was biology, with 29% of the class electing that as their undergraduate field of study. Science majors taken together accounted for 62% of all majors, while 23% majored in the humanities and 15% majored in the social sciences. Among the humanities majors, history was the most common choice, while economics was the most popular choice among those majoring in the social sciences. The selection of major among the graduates represents a rather dramatic change from previous classes, reflecting the larger proportion of postbaccalaureate students in this class. These changes are likely to persist as both the postbaccalaureate and PLME students are less likely to be science majors than traditional premedical students or the seven-year MEP students were.

Table 1– **Demographic Characteristics of the MD Graduates of the Brown University School of Medicine Class of 1992**

		No.	Percent
Sex			
	Male	53	63.9
	Female	30	36.1
Race			
	White	66	79.5
	Asian	12	14.5
	Black	2	2.4
	Hispanic	2	2.4
	Portuguese-American	2	2.4
State of Residence			
	Rhode Island	24	28.9
	New York	19	22.9
	California	7	8.4
	New Jersey	7	8.4
	Massachusetts	6	7.2
	Connecticut	4	4.8
	Maryland	3	3.6
	Illinois	2	2.4
	Mississippi	2	2.4
	Washington	2	2.4
	Other States	6	7.2
	Other Countries	1	1.2

Fig.1 – **Specialty Choices of the Brown University Program in Medicine Class of 1992**



Where They are Going

Internal medicine remains the most frequently selected specialty. The proportion of the graduates entering internal medicine seems to be rebounding from the historical lows witnessed in the last four years, as shown in Table 2.

The proportion of the class entering specialties in primary care rose dramatically from the previous year, reversing a downward five-year trend. More than half of the graduates entered residency training programs in the primary care fields of internal medicine, pediatrics, and family practice, representing a 46% increase over the previous year. The increase in the number of graduates entering the field of internal medicine was matched by an equally large increase in the number entering family practice. Figure 1 illustrates the specialty choices of the Class of 1992.

Table 2– Specialty Choices of the MD Graduates of the Brown University Program in Medicine Class of 1992

	Graduating Class									
	1988		1989		1990		1991		1992	
Specialty Choice	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Primary Care, total	38	(48.1)	31	(38.8)	34	(44.2)	29	(38.7)	43	(56.6)
Internal Medicine, total	22	(27.8)	20	(25.0)	15	(19.5)	15	(20.0)	22	(28.9)
Categorical Medicine	19	(24.0)	14	(17.5)	13	(16.9)	13	(17.3)	16	(21.1)
Primary Care Medicine	3	(3.8)	6	(7.5)	2	(2.6)	2	(2.7)	6	(7.9)
Pediatrics	10	(12.7)	7	(8.8)	10	(13.0)	10	(13.3)	11	(14.5)
Family Medicine	6	(7.6)	4	(5.0)	8	(10.4)	4	(5.3)	0	(13.2)
Medicine/Pediatrics	0	(0.0)	0	(0.0)	1	(1.3)	0	(0.0)	0	(0.0)
Surgery	9	(11.4)	6	(7.5)	10	(13.0)	9	(12.0)	2	(2.6)
Surgical Subspecialties, total	2	(2.5)	15	(18.8)	4	(5.2)	6	(8.0)	9	(11.8)
Ophthalmology	2	(2.5)	6	(7.5)	3	(3.9)	3	(4.0)	6	(7.9)
Orthopedics	0	(0.0)	4	(5.0)	0	(0.0)	2	(2.7)	1	(1.3)
Neurosurgery	0	(0.0)	2	(2.5)	0	(0.0)	0	(0.0)	1	(1.3)
Urology	0	(0.0)	1	(1.3)	1	(1.3)	1	(1.3)	0	(0.0)
Plastic Surgery	0	(0.0)	1	(1.3)	0	(0.0)	0	(0.0)	0	(0.0)
Otorhinolaryngology	0	(0.0)	1	(1.3)	1	(1.3)	1	(1.3)	1	(1.3)
Emergency Medicine	2	(2.5)	2	(2.5)	1	(1.3)	3	(4.0)	3	(3.9)
Obstetrics & Gynecology	4	(5.1)	7	(8.8)	4	(5.2)	8	(10.7)	6	(7.9)
Psychiatry	4	(5.1)	3	(3.8)	1	(1.3)	2	(2.7)	4	(5.3)
Neurology	4	(5.1)	3	(3.8)	1	(1.3)	2	(2.7)	3	(3.9)
Transitional	10	(12.7)	2	(2.5)	7	(9.1)	3	(4.0)	1	(1.3)
Institutional Specialties, total	6	(7.6)	9	(11.3)	13	(16.9)	10	(13.3)	5	(6.6)
Anesthesiology	2	(2.5)	4	(5.0)	3	(3.9)	1	(1.3)	1	(1.3)
Pathology	1	(1.3)	1	(1.3)	0	(0.0)	1	(1.3)	2	(2.6)
Rehabilitation Medicine	0	(0.0)	0	(0.0)	1	(1.3)	1	(1.3)	1	(1.3)
Radiology	3	(3.8)	4	(5.0)	9	(11.7)	7	(9.3)	1	(1.3)
TOTALS*	79	(100.1)	80	(100.3)	77	(100.1)	75	(99.9)	76	(99.8)

*Totals do not add to 100.0 due to rounding

Table 3 lists all of the Class of 1992 graduates and where they will be going to do their residency training. Of the 76 graduates who will enter residency training next year (seven are delaying their residencies for one year), 20 graduates (26%) matched with Brown-affiliated residency programs and will be staying in the state. Next to Providence, Boston seemed to be a particularly attractive place for the Class of 1992, with eight of its members going to the greater Boston area for their first post-graduate year of training. New York City will be home for five graduates, while San Francisco and Rochester, NY each will be the home for four graduates.

New York will be the home for 12 graduates next year and ranks second to Rhode Island as the most popular state for residency training. Table 4 lists those states where the graduates will be going for their first year of residency training. As with preceding classes, this class overwhelmingly preferred the Northeast and West Coast to the South and Central states. Nearly two-thirds (62%) will be spending their first year of residency in the Northeast and one-fifth on the West Coast. In contrast, only six students (8%) will be in the South, and eight students (11%) will be in the Central region.

Conclusion

The MD Class of 1992 may mark a turning point in career choice patterns for graduates of the Brown University School of Medicine. Graduates appear to be reversing a five-year trend in which subspecialization, especially in the surgical subspecialties and institutional specialties, attracted increasing proportions of the class at the expense of the primary care specialties.

This change in pattern does not seem limited to one particular portion of the class. Postbaccalaureate students are not more likely to be attracted to the primary care specialties than the other students, so the unusually large proportion of postbaccalaureate students in this class is not the explanation. National data are not yet available to be able to compare to the experience at Brown. Only time will tell if the promising trends of this year's class will continue.

Acknowledgments

My thanks to Ruth Sauber and Marilyn Doyle in the Office of Medical Student Affairs, Brown University School of Medicine for assistance in summarizing the data.

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Table 3–Brown University School of Medicine Class of 1992 Residency Positions

Name of Graduate	Hospital Name/Medical School Affiliation	Specialty
Ashley, David	Rhode Island Hospital/Brown University	Emergency Medicine
Bahadur, Gagan	CMHS/St Joseph Mercy/University of Michigan	Internal Medicine/Prelim
	Manhattan Eye, Ear and Throat Hospital/Cornell University	Ophthalmology
Bertelsen, Judy	Mt. Zion Medical Center/University of California, SF	Internal Medicine
Borges, Octavio	Roger Williams General Hospital/Brown University	Internal Medicine/Prelim
	Albany Medical Center Hospital/Albany Medical College	Ophthalmology
Brown, Lucy	Rhode Island Hospital/Brown University	Pediatrics
Burns, Stephen	University of Washington Affiliated/University of Washington	Physical Med & Rehab
Chang, Kay	University of Washington Program/University of Washington	Surgery/ENT
Chobanian, Nishan	Wright-Patterson USAF Medical Center/Ohio	Ob/Gyn
Clark, Jimmie	Tuscaloosa Family Practice/University of Alabama	Family Medicine
Clegg, Kevin	David Grant USAF Medical Center/California	Pediatrics
Delhagen, John	California Pacific Medical Center/University of California SF	Internal Medicine/Prelim
	University of California, SF	Anesthesiology
DeMaio, Richard	Delaying Residency	
Dierolf, Christina	Rhode Island Hospital /Brown University	Pediatrics
Doolittle, Marc	Brigham and Women's Hospital/Harvard University	Pathology
Dostou, Jean	Strong Memorial Hospital/ University of Rochester	Internal Medicine
Ducharme, Joseph	Miriam Hospital/Brown University	Internal Medicine/Prelim
	Rhode Island Hospital/Brown University	Ophthalmology
Eley, Marcia	Delaying Residency	
Enriquez, Ronald	University of California, SF	Pediatrics/Primary
Enzinger, Peter	Strong Memorial Hospital/University of Rochester	Internal Medicine
Figueira, G. Christina	Miriam Hospital/Brown University	Internal Medicine
Fitzsimons, Julie	Rhode Island Hospital/Brown University	Primary Care Medicine
Fuchs, Ronald	Delaying Residency	
Gaffney, Kevin	University of Michigan Hospitals/University of Michigan	Internal Medicine
Gartner, Richard	California Pacific Medical Center/University of California, SF	Internal Medicine
Geffroy, Margot	St. Elizabeths Hospital/Tufts University	Internal Medicine/Prelim
	New England Medical Center/Tufts University	Neurology
Glassman, Laurie	Rhode Island Hospital/Brown University	Pediatrics
Golding, Ilyssa	Faulkner Hospital/Tufts University	Internal Medicine/Prelim
	Cedars-Sinai Medical Center/University of California, LA	Radiology-DX
Goldstein, Susanne	Faulkner Hospital/Tufts University	Internal Medicine/Prelim
	Rhode Island Hospital/Brown University	Neurology
Gordon, Seth	Mary Imogene Bassett/Columbia University	Primary Care Medicine
Granof, Nancy C.	The New York Hospital/Cornell University	Primary Care Medicine
Griswold, Steve	Moses H. Cone Memorial Hospital/University of North Carolina	Family Medicine
Gross, Arthur	Albert Einstein Community Hospital/Albert Einstein College	Ob/Gyn
Guglielmo, Maria	Rhode Island Hospital/Brown University	Surgery/Prelim / Neurosurgery
Hanfling, Dan	Miriam Hospital/Brown University	Internal Medicine/Prelim
	George Washington University	Emergency Medicine
Haworth, Merry Jayne	University of Iowa Hospitals & Clinics/University of Iowa	Family Medicine
Jones, William	Trinity Lutheran Hospital/University of Missouri	Family Medicine
Kang, Audrey	Vanderbilt University Medical/Vanderbilt University	Ob/Gyn
Kassner, Richard	Butler Hospital/Brown University	Psychiatry
Kathuria, Chirinjeev	Delaying Residency	
Kennedy, John	Harbor-UCLA Medical Center/University of California	Internal Medicine
Lan, Norry	University of Connecticut/University of Connecticut	Internal Medicine
Lanna, Thomas	Roger Williams General Hospital/Brown University	Internal Medicine
Larson, Ramsey	Lancaster General Hospital/Temple University	Family Medicine
Lee, Grace	Vanderbilt University Medical/Vanderbilt University	Ob/Gyn
Levin, Samuel	Albany Medical Center Hospital/Albany Medical College	Ob/Gyn
Li, Thomas	Strong Memorial Hospital/University of Rochester	Internal Medicine
Lundeen, Carrie	Memorial Hospital/Brown University	Family Medicine
Macaulay, Robert	University of New Mexico School of Medicine	Pathology
Manown, Timothy	Walter Reed Army Medical Center/Washington, DC	Internal Medicine
Marinelli, Frank	Beth Israel Hospital/Harvard University	Internal Medicine
Mason, Katherine	University Hospital of Cleveland/Case Western Reserve University	Pediatrics
Morales, Robert	Delaying Residency	
Morrison, Elizabeth	Delaying Residency	
Nenno, Claudia	Memorial Hospital/Brown University	Family Medicine
Newstein, Michael	Miriam Hospital/Brown University	Internal Medicine
Olmedo, Margaret	Delaying Residency	
Parkas, Valerie	The New York Hospital/Cornell University	Internal Medicine
Pet, L. Russell	Butler Hospital/Brown University	Psychiatry
Porter, William	Contra Costa County/University of California, Davis	Family Medicine
Rodman, Richard	Mount Auburn Hospital/Harvard University	Internal Medicine/Prelim
	University of Michigan/University of Michigan Medical School	Ophthalmology
Rosenstock, Jason	University Health Center/University of Pittsburgh	Psychiatry
Saphier, Carl	Brigham and Women's Hospital/Harvard University	Ob/Gyn
Schultz, Stephen	Highland Hospital/University of Rochester	Family Medicine

Table 3– Brown University School of Medicine Class of 1992 Residency Positions (cont)

Name of Graduate	Hospital Name/Medical School Affiliation	Specialty
Selanikio, Joel	Emory University School of Medicine	Pediatrics
Sherman, Pamela	Rhode Island Hospital/Brown University	Surgery/Prelim
	Hospital for Special Surgery/Cornell University	Orthopedics
Simons, Brad	Winthrop University Hospital/SUNY	Internal Medicine/Prelim
	Scheie Eye Institute/University of Pennsylvania	Ophthalmology
Smith, Jean	University of Massachusetts Coordinated Programs	Surgery
Stein, Wendy	Rhode Island Hospital/Brown University	Primary Care Medicine
Suh, Jin	New York University Medical Center/New York University	Internal Medicine
Suk, Stephen	Tripler Army Medical Center/Hawaii	Surgery
Suner, Selim	Rhode Island Hospital/Brown University	Emergency Medicine
Tillinghast, Guy	University of Massachusetts Hospital/University of Massachusetts	Internal Medicine
Tran, Mai-Khanh	UCLA Medical Center/UCLA	Pediatrics
Verneris, Michael	Children's National Medical Center/George Washington University	Pediatrics
Vine, John	University of North Carolina	Internal Medicine/Prelim
Walton, April	Wright-Patterson USAF Medical Center/Ohio	Psychiatry
Waltzman, Roger	Beth Israel Hospital/Harvard University	Internal Medicine
Wasermann, Joel	Providence Family Medical Center/University of Washington	Family Medicine
Winterbottom, Lisa	Rhode Island Hospital/Brown University	Primary Care Medicine
Wisdom, Jerald	University of Southern California School of Medicine	Anesthesiology
	University of South Carolina School of Medicine	Ophthalmology
Wolk, Sarah	Fitzsimons Army Medical Center/Colorado	Pediatrics
Woo, Andrew	The New York Hospital/Cornell University	Internal Medicine/Prelim
	University of California, Los Angeles	Neurology
Youth, Brian	University of Minnesota Hospital & Clinic/University of Minnesota	Pediatrics

Table 4–State in Which the First Year of Residency Training Is Located for the Brown University Program in Medicine MD Class of 1992

State	No.	(%)
Alabama	1	(1.2)
California	9	(10.8)
Colorado	1	(1.2)
Connecticut	1	(1.2)
District of Columbia	2	(2.4)
Georgia	1	(1.2)
Hawaii	1	(1.2)
Iowa	1	(1.2)
Massachusetts	10	(12.0)
Michigan	2	(2.4)
Minnesota	1	(1.2)
Missouri	1	(1.2)
New Mexico	1	(1.2)
New York	12	(14.4)
North Carolina	2	(2.4)
Ohio	3	(3.6)
Pennsylvania	2	(2.4)
Rhode Island	20	(24.1)
Tennessee	2	(2.4
Washington	3	(3.6)
Delaying Residency	7	(8.4)
Total*	83	(99.7)

*Total does not equal 100 due to rounding

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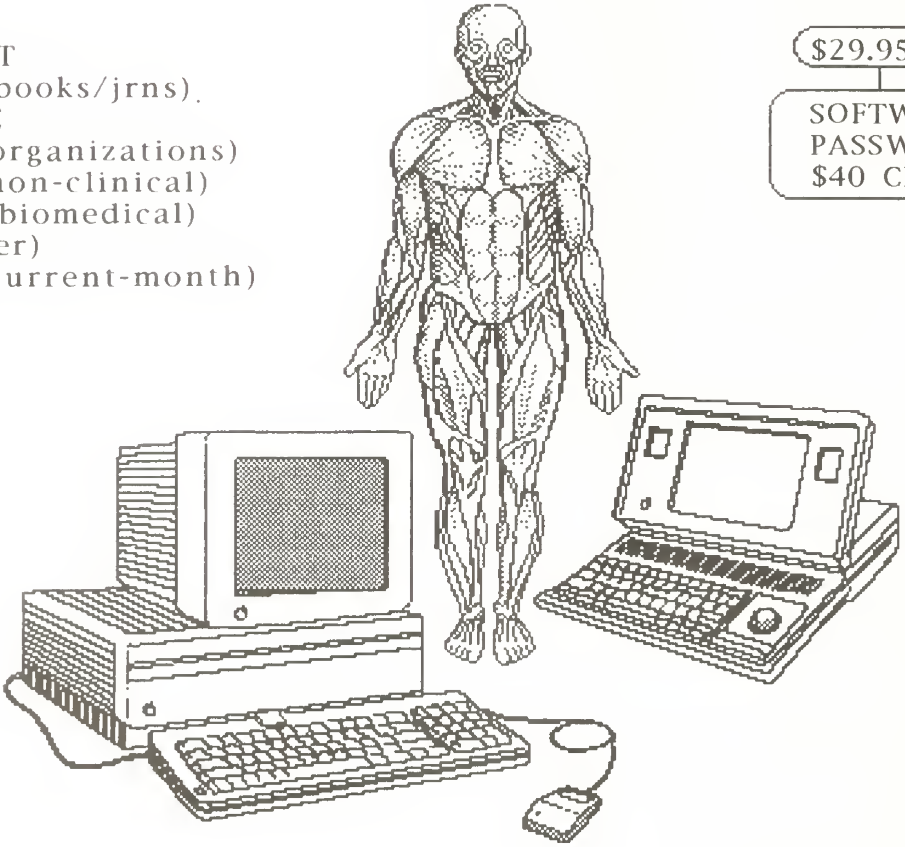

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Resident Physician Abstracts: Annual Scientific Meeting of the Rhode Island Chapter of the American College of Physicians

The quality of presentations was felt to be outstanding.

Fred J. Schiffman, MD

The sixth annual joint meeting of the Rhode Island Chapter of the American College of Physicians (ACP) and the Department of Medicine at Brown University was held at the Omni Biltmore Hotel on Wednesday, April 8. This year's agenda included a panel discussion on "Access to Health Care 1992" with participants Joseph A. Chazan, MD, FACP, governor, Rhode Island Chapter of the ACP; Barbara A. DeBuono, MD MPH, FACP, director, Rhode Island Department of Health; Norton J. Greenberger, MD, MACP, past president of the American College of Physicians; Denman Scott, MD, MPH, associate executive vice president, Health and Public Policy, American College of Physicians; and Blair Suellentrop, MD, CEO, Ocean State Physicians Health Plan. This took place between 11:30 am and 12:30 pm and was followed by a luncheon attended by conference participants and after which a message from the official college representative, Norton J. Greenberger, was presented to the assembled group.

The Irving A. Beck award (named for Irving A. Beck, MD, an eminent Rhode Island physician and a member of the American College of Physicians) was presented to an outstanding internist and a member of the American College of Physicians, Rhode Island Chapter for long and sustained career service to patients. This year's recipient was Henry F. Izeman, MD, FACP. Dr Izeman was born in Providence, attended Brown University and Tufts Medical School, interned at the Buffalo General Hospital, took his medical residency at the Rhode Island Hospital and subsequently did a year's fellowship in renal-metabolic disease at Georgetown University. He is board certified by the American Board of Internal Medicine as a diplomate in geriatric medicine. He serves as a clinical professor of medicine at Brown University and is on the active staff of Miriam Hospital and Rhode Island Hospital. In addition, he is medical director of the Jewish Home for the Aged and on the board of directors of the Rhode Island PSRO. He is a past president of the Rhode Island Society of Internal Medicine and has been active in many activities of the college. Dr Izeman was recognized for the quality of his practice of internal medicine that has taken place in Rhode Island since 1964. He has always brought the highest level of compassion and care to his patients. In addition he has always been recognized as an outstanding teacher of medical students and house staff and was felt to be a particularly worthy recipient of the award this year.

Most of the day was filled with presentations by Brown University house officers who prepared their work with office and hospital-based faculty members from Memorial Hospital, Miriam Hospital, Providence Veterans Administration Hospital, Rhode Island Hospital and Roger Williams General Hospital. The residents' scientific presentations were once again both in the oral (16 presentations by house officers) and poster format (37 presentations by house officers and some fellows). Clinical investigations and clinical vignettes were presented in each format. (The abstracts of the orally presented material are included at the end of this article.) This year once again, no prizes were awarded for selected presentations; however, all presenters were honored and this took the form of beautiful wooden plaques for those who presented orally and calligraphed certificates for poster presenters. All participants also received a full year's membership to the American College of Physicians which includes a subscription to the *Annals of Internal Medicine*. The quality of presentations was felt to be outstanding. The range of topics was wide and varied from basic scientific investigations to more descriptive clinical entities.

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ABBREVIATIONS USED:

FACP: Fellow of the American College of Physicians
MACP: Master of the American College of Physicians

1. In Vivo and In Vitro Evidence for Vascular Angiotensin II Blockade by Calcium Antagonists.

Nabil S. Andrawis, MD, PhD, Memorial Hospital, and Darrell R. Abernethy MD, PhD

The purpose of this study is to understand how calcium antagonists (CAs) induce a decrease in peripheral vascular resistance in vivo in humans. Angiotensin II (AII) has been shown to play a major role in maintaining vascular tone in vivo and to induce vascular smooth muscle cell (VSMC) hypertrophy in culture. We compared and contrasted the capacity of CA drugs to reverse AII induced vasoconstriction using brachial artery infusion and measurement of forearm blood flow by strain gauge plethysmography in 39 young healthy male volunteers. In a dose-dependent manner CAs blocked AII-induced vasoconstriction. At 7.64 and 19.1 μ g/min infusion rates for nifedipine and verapamil respectively, they abolished AII effect, while diltiazem at 19.1 μ g/min significantly blocked AII effect. To explore this mechanism in more detail we studied effects of CAs on cultured VSMCs. Verapamil decreased cell-associated Ca^{2+} in $^{45}Ca^{2+}$ efflux experiment and in a dose-dependent and time-dependent manner it decreased basal $[^3H]$ uridine uptake and completly abolished AII-induced increase in $[^3H]$uridine uptake by VSMCs. In quiescent VSMCs it decreased α-vascular actin mRNA by 31% (which is used as a marker of cytoskeletal proteins). In addition, it reversed AII-mediated increase of α-vascular actin mRNA from 160% to 70% of control. We conclude that a major mechanism of CAs action in decreasing peripheral vascular resistance is their blockade of AII-mediated vascular effects. This blockade involves both the immediate and remote effects of AII on VSMCs. The present work provides new insight into mechanisms by which CAs reduce peripheral vascular resistance.

2. High Dose Ascorbate Supplementation Does Not Lower Elevated Plasma Lipoprotein(a).

Andrew Boston, MD (Associate), Rhode Island Hospital, Charles Eaton, MD, Jennifer Jenner, BS, Neal Azrolan, PhD, Joseph Lurino, PhD, Sukanya Rao, PhD and Ernst Schaefer, MD

Lipoprotein(a) [Lp(a)], a potential "link" between atherosclerosis and thrombosis, is an independent risk factor for premature coronary heart disease (CHD), particularly at plasma levels >40 mg/dL. Unfortunately, Lp(a) is refractory to standard dietary and pharmacologic lipid lowering interventions. Recent animal model data demonstrate that supplemental ascorbate (40 mg/kg) can prevent Lp(a) accumulation in the arterial wall, perhaps by lowering plasma Lp(a) concentrations. Accordingly we studied the effect of 6 grams per day oral ascorbate on plasma Lp(a) levels in 2 patients with hyper-Lp(a)-lipoproteinemia (>40 mg/dL), and premature CHD.

After non-fasting Lp(a) levels (measured by a monoclonal-polyclonal dual antibody ELISA) were found to be >40 mg/dL, the 2 patients (#1 a 48 y/o WM; #2 a 61 y/o BF), each with premature CHD (MI at <60 y/o), had baseline fasting determinations of plasma Lp(a), ascorbate (Vit. C), total cholesterol (TC), triglycerides (TG), and HDL-cholesterol (HDL). Apo(a) isoform was also characterized in each patient. Dietary intake (Willett food frequency questionnaire), and medication usage were also assessed, and remained constant throughout the study. Two grams of Vit C were ingested with each meal (= 6g/d) for 6 weeks. Repeat determinations of plasma Lp(a), Vit. C, TC, TG, and HDL were made at the end of 3 and 6 weeks.

Results:		{Lp(a)	Vit. C	TC	HDL	TG} mg/dL
Pt #1	0 wks	50	2.7	230	30	446
	3 wks	44	5.8	224	31	341
	6 wks	45	2.0	283	29	687
Pt #2	0 wks	132	3.8	246	42	395
	3 wks	117	4.5	236	37	301
	6 wks	123	4.7	241	38	225

We conclude that high dose ascorbate supplementation does not lower plasma Lp(a) levels. The role of ascorbate in maintaining extracellular matrix integrity and inhibiting intimal penetration of Lp(a) or other atherogenic lipoproteins requires elucidation.

3. Porcelain Gallbladder.

Hal Buch, MD, Memorial Hospital, Joseph Ducharme and Amer Malik, MD.

A retrospective review of 2918 consecutive cholecystectomies was performed to investigate the overall incidence of porcelain gallbladder (PGB). PGB was defined as deposition of calcium in the gallbladder wall. Previous cholecystectomy reviews reported incidences of PGB from 0.069 to 1.45%. A female preponderance has been reported (range of 3:1 to 5:1, female:male). A relationshp between PGB and gallbaldder adenocarcinoma has also been suggested. Of the 111 total PGB cases in the literature, 40 had cancer, for an overall incidence of 36% (range 0-66%). 90-95% of PGBs are associated with gallstones. The pathogenesis may be related to cholelithiasis and chronic cholecystitis.

Of the cholecystectomies we reviewed, 6 PGBs were discovered, an incidence of 0.21%. All cases were female with an age range of 42 to 88 years (mean age 61.5). All cases were associated with both cholelithiasis and chronic cholecystitis. However, none of the PGBs were associated with carcinoma. Moreover, in no instance was calcification noted in the gallbladder wall of the 18 gallbladder adenocarcinomas that were detected in reviewing the 2918 consecutive cholecystectomies.

Our findings suggest that the overall incidence and the sex distribution of PGB is similar to that reported previously. We confirm the strong association between PGB and cholelithiasis/chronic cholecystitis. We are unable to confirm the suspected relationship between PGB and gallbladder carcinoma. This may be due to the relative rarity of this condition.

4. Decline in CD4 Count from time of Seroconversion in HIV Positive Women.

Naiyer Imam, MD, Miriam Hospital, Timothy Flanagan, MD, Charles CJ Carpenter, MD

Studies have been done in men which delineate the decline of CD4 from the time of seroconversion. Limited data on the decline of CD4 count is available in women. At the Brown University AIDS Program, we have identified 24 women for whom the time of seroconversion is known to within a period of six months. All of the CD4 values for these patients were plotted on a single curve. The best fitting linear equation was determined using least squares analysis methods. The results predict a period of 3.95 years elapses before the CD4 declines to 500. This supports data obtained from a study of 1700 men. The time for CD4 count to drop below 200 is estimated to be 10.5 years from the initial time of seroconversion. However, it must be noted that these patients started AZT treatment when their CD4 counts dropped below 500.

5. A Case of *Schistosomiasis Hematobium* in a 27-year-old Nigerian Woman Presenting with Hematuria.

Scott Allen, MD, Miriam Hospital, G. Richard Olds, MD

A 27- year-old Nigerian woman was referred to a urologist in Rhode Island following an unrevealing gynecologic workup for a 2-year history of blood in her urine. The patient denied any dysuria or urgency although she did report a 2-year history of right flank pain exacerbated by lying down. She denied any history of urinary stones, and family history for urinary disease was negative. Work-up by the urologist included a routine urinalysis which showed a pH of 7.6, moderate blood, urobilinogen, moderate leukocyte esterase, 6 WBCs, 4 RBCs and few bacteria. Cystoscopy revealed "solid, pink, raised tumor to the left and below the air bubble" and "small early areas of tumor in the mid-high posterior bladder." A biopsy was obtained and while results were pending, the patient was informed that she had bladder cancer. The subsequent pathology report revealed multiple ova of *schistosomiasis hematobium* surrounded by granulomatous inflammation.

Worldwide, the leading cause of hematuria in young adults is *schistosomiasis hematobium*. Schistosomiasis, a chronic trematode infection, affects more than 200 million people. If the diagnosis is suspected, *S. hematobium* is easily detected by examination of early or mid-day urine specimens. More important, the infection is easily treated by a single dose of praziquantel. Early detection is important because the complication of urinary obstrution leading to renal failure is often asymptomatic. In addition, untreated infection increases the risk of squamous cell carcinoma of the bladder.

6. A Profound Hypokalemia, Metabolic Alkalosis, and Subsequent Rhabdomyolysis from Alka-Seltzer Ingestion and Malnutrition.

Stephen Beaupre, MD, Memorial Hospital, David Yoburn, MD

AP is a 35-year-old white male with a benign PMH who presented with progressive generalized weakness over 3 weeks, dark colored urine over the last 3 days and a 40 lb weight loss over the last 4 months secondary to poor p.o. intake. He also admitted to consuming a liter of whiskey/day and ingesting Alka-Seltzer 1-1/2-2 ppd over the last 4 months.

Physical exam was notable for 2/5 weakness in all extremities, decreased deep tendon reflexes and diffuse muscle tenderness. Orthostatics were not done secondary to his diffuse weakness. Lab data was significant for sodium 135, potassium 1.3, chloride 76, serum bicarb 47, BUN 2, creatinine 0.6, calcium 7.1, albumin 2.5, magnesium 1.5, phopshorus 1.7, CPK 13,740, ABG on 4 1, pH 7.63, PCO_2 of 43, PO_2 of 98. Urinalysis was significant for brown color with pH >9, 2+ bilirubin, 2+ blood, specific gravity of 1.01 positive urobilinogen, 10-15 WBCs, 30-40 RBCs/HPF, and coarse granular casts. Urine myoglobin was 4,760 ng/ml (normal <16). EKG was read as a sinus tachycardia at a rate of 100 with normal pr, qrs, and qt intervals and ST/T-wave changes consistent with ischemia, drugs, and/or metabolic abnormalities. Chest X-ray was read as unremarkable. Tox screen was unremarkable. The patient was admitted to the ICU, was given aggressive magnesium, potassium and phosphorus repletion and IV hydration. The patient's weakness, muscle tenderness and CPK values resolved to normal with correction of these profound metabolic abnormalities.

The etiology of these extreme metabolic abnormalities was secondary to ingestion of large quantities of Alka-Seltzer (bicarbonate) and a markedly decreased p.o. intake. These, in turn, produced a severe metabolic alkalosis and a subsequent bicarbonate diuresis causing a urinary loss of magnesium, potassium, calcium, phosphorus, and sodium. The low potassium and the low phosphate subsequently led to rhabdomyolysis.

7. Scombroid Syndrome: Another Fish Story.

Denise E. Burns, MD (Associate), Miriam Hospital, Carol Garner, MD

A 53-year-old woman presented to the EU complaining of an itchy rash all over her body. Earlier in the evening, she had eaten a tuna steak with hollandaise sauce. An hour or so later she noted bilateral palmar itching and redness which soon spread to her face, neck, arms and legs. She experienced some nausea, diarrhea, and hoarseness without dyspnea. She had never previously experienced an allergic reaction to any foods or medications. After her arrival in the EU, she developed hypotension 70mm Hg systolic, with a tachycardia of 122. Skin exam revealed a diffuse erythematous macular rash which later progressed to multiple plaques. There was no stridor or tongue swelling. Lungs were clear.

The patient's hypotension was successfully treated with IV fluids and dopamine. She received epinephrine and IV steroids for suspected anaphylaxis and one dose of IV Nafcillin to treat possibly Staphylococcal toxic shock, then was transferred to the ICU. She improved overnight, was easily weaned from dopamine, and felt completely well the next morning. She was discharged on the second hospital day with the presumptive diagnosis of scombroid food poisoning.

Worldwide, scombroid poisoning is the most common cause of toxicity from fish ingestion but is often not recognized. It occurs with the consumption of improperly handled dark-meated fish of the suborder Scombroidea (tuna, albacore, mackerel, skipjack, bonito) and also fish not in this group (amberjack, mahi-mahi, bluefish). Symptoms usually occur within one hour after consumption and include flushing, erythema and urticaria, oropharyngeal burning, headache, nausea, diarrhea, abdominal cramps, palpitations and occasional hypotension and bronchospasm. Symptoms usually resolve spontaneously within 12 hours.

Recent studies conclude that the toxin responsible for these symptoms is exogenous histamine with associated mediators, not endogenous histamine associated with mast cell degranulation. Naturally occurring histidine in fish flesh is converted to histamine by fish enteric microbes when fish is stored at temperatures above 20°C. Although histamine is generally inactivated in the human gut to N-acetyl histamine, it is thought that the ingested histamine may be absorbed directly through the oral mucous membranes ("peppery taste") along with other produced diamines which serve as potentiators of histamine absorption. Increased levels of histamine and its metabolites have been demonstrated in the urine of affected individuals. Accepted treatment includes cimetidine and diphenhydramine. Primary prevention is the most effective means of decreasing disease incidence. This entails appropriate handling and storage of fish immediately after being caught..

8. Idiopathic Acquired Factor VIII Inhibitor.

Chang Y. Cho, MD (Associate), Miriam Hospital, and Duchelia Struier, MD

A 78-year-old woman presented with an enlarged, tender left calf and heme positive stools. Past medical history was significant for CRB with an MI in 1987. On admission she was noted to have an Hg and Hct of 7.0 and 22. PT and PTT were 12.5 and 80. Platelet count was normal. The next day her left calf became ecchymotic, manifesting evidence of a soft tissue bleed. She required multiple transfusions although a work-up for a GI bleed revealed no active site. A CT of the abdomen and chest revealed a large retrocardiac mass extending down into the abdomen. An echocardiogram confirmed this to be an old pseudoeneurysm of the left ventricle from her previous MI. Her PTT remained elevated with partial correction by 1:1 dilution from 80 to 44. Lupus anticoagulant was negative. Factor activity was assessed with Factor VIII found to be <1% of normal. An auto-antibody to Factor VIII was detected and quantitated at >500 Bethesda units. RNA was <1:40. RF was <1:20. No lymphadenopathy was noted on exam. Serum protein electrophoresis showed total protein of 5.7 without an abnormally elevated band.

While development of Factor VIII inhibitor occurs in approximately 10% to 20% of hemophiliacs, it is an extremely rare event in nonhemophiliacs, occurring in one of every 5 million individuals. In this latter group, as many as 87% suffer from a serious hemorrhagic complication with a mortality rate as high as 22%. The auto-antibodies against Factor VIII are predominantly of the IgG class, and frequently the IgG_4 subclass with κ light chains. In one large series, the most common associated diseases include autoimmune disorders (18%), such as Rh (8%) and SLE (6%), post-partum women (7%), malignancies (7%), and drug related (5%). Of note, 46% of patients in this survey had no identifiable associated condition.

Treatment for Factor VIII inhibitors includes the use of human factor VIII in quantities sufficient to overwhelm the inhibitor. When the inhibitor levels are high, as in this case, porcine Factor VIII is often favored over its human counterpart due to its lower cross-reactivity with the inhibitors. Clinical response to porcine Factor VIII was found in approximately 82% of recipients. Hemostasis was achieved with few side effects. Cytotoxic suppression of the inhibitor, with corticosteroids alone or in combination with cyclophosphamide and vincriatine, is used to achieve long term results. Eleven of 12 patients receiving the three agents together responded favorably with elimination of the inhibitor and cessation of bleeding.

In this patient, porcine Factor VIII was considered but deferred after the patient stabilized hemodynamically without intervention. She was started on a course of chemotherapy with the combination of prednisone, cyclophosphamide and vincristine.

9. Washing Clothes – A High Risk Job?

Ivan Coronado, MD (Associate), Providence Veterans Administration Hospital, and Frederic Silverblatt, MD

A 50-year-old woman presented with progressive dyspnea, pleuritic chest pain, and weight loss over three weeks. Past history included systemic lupus erythematosus, hypothyroidism, and a seizure disorder. The patient had a 60 pack-year history of smoking and had worked as a secretary in the armed forces. She denied exposure to asbestos. Medicines included synthroid and an anticonvulsant.

Physical exam revealed a comfortable woman with a temperature of 102ºF, pulse 92, and BP 110/62. Thyroid was slightly enlarged. Breath sounds were diminished and there was dullness to percussion at the right base.

WBC was 14,100, Hgb 10 g/dl, Hct 29.5% and O_2 saturation 89% on room air. Chest x-ray showed a large pleural effusion on the right. Chest CT scan revealed extensive pleural thickening with a loculated effusion. On thoracentesis, the pleural fluid was hemorrhagic and cultures were negative. Cytology was not diagnostic. The patient subsequently underwent open pleural biopsy which showed a malignant mesothelioma.

Further questioning revealed that the patient had washed her husband's clothes for 20 years. He was a shipyard worker. Radiation therapy and intrapleural chemotherapy were tried and proved unsuccessful.

This case illustrates the development of malignant mesothelioma through indirect exposure to the asbestos fiber. Although this neoplasm may rarely arise de novo, a history of direct or indirect exposure can be elicited in the great majority of cases.

10. Acetazolamide-Induced Ammonia Intoxication in a Patient with Normal Liver Function.

Curtis Donskey, MD, Miriam Hospital, and Rex Mahnensmith, MD

Acetazolamide inhibits carbonic anhydrase and is commonly used in the treatment of glaucoma to reduce anterior chamber fluid production. A side effect of carbonic anhydrase inhibition is renal bicarbonaturia and metabolic acidosis. We describe a case of acetazolamide overdose, which resulted in acidosis, ammoniagenesis, and stupor because the generated ammonia could not be excreted.

A 70-year-old man taking acetazolamide, prednisone, cytoxan, and allopurinol for glaucoma and lymphoma was brought to the hospital in stupor. His pills were found mixed in containers with few acetazolamide pills remaining from a recent prescription. A hyperchloremic acidosis with extreme hyperpnea, hypokalemia, alkaline urine, azotemia, and serum ammonia 305 were documented. Liver enzymes and function tests were normal. Head CT and tox screens were negative. Glucose and calcium were normal. Treatment with saline, furosemide, and lactulose resulted in normalization of his mental status and serum ammonia concurrently. We then learned that he had consumed up to 6 acetazolamide tablets per day, confusing them with his other tablets because of poor eyesight.

Bicarbonaturia, acidosis, and ammoniagenesis are stimulated with acetazolamide. This man accumulated very high levels of ammonia because its excretion was impaired due to his alkaline urine at the same time that its generation was accelerating, both derivative consequences of carbonic anhydrase inhibition in the kidney, bicarbonaturia, and acidosis. His mildly dehydrated state was a confounding factor as well. We could find no report of this complication of acetazolamide in the literature.

11. Metastatic Masquerader: Chondrosarcoma Metastatic to the Right Ventricular Outflow Tract Presenting as Pulmonary Embolism and Right Heart Failure.

Stephen D. Pratt, MD, Miriam Hospital, Fred Schiffman, MD, FACP, Kenneth Korr, MD

Cardiac involvement by metastatic sarcoma is not an infrequent occurrence. Such lesions are usually seen in the setting of widespread disease, but are seldom diagnosed ante-mortum as they are often clinically silent. We present a case of solitary metastatic sarcoma involvement of the heart presenting as a pulmonary embolism and right ventricular outflow obstruction.

FM is a 65-year-old white female with a past medical history significant for bilateral breast cancer in 1985 and removal of a non-osseous sarcoma from her right knee approximately 20 years ago. She presented in August 1991 with severe dyspnea, and chest pain. Pulmonary embolism was diagnosed by V/Q scan, and she was begun on warfarin.

She was admitted to our institution in October 1991 with worsening dyspnea on exertion, a band-like chest tightness, and bilateral ankle edema. Physical exam was significant for mild pedal edema, and a 2/6 systolic flow murmur over the third left intercostal space which was louder sitting than supine. Work up revealed a V/Q scan that was unchanged from that of August 1991. Also, a large mass was seen in the pulmonary outflow tract, first on echocardiography and later on right heart catheterization. CT of the abdomen, pelvis and thorax were unremarkable.

The patient underwent surgical removal of the cardiac mass. The operative report described a 10 cm polypoid mass attached to the inferior surface of the pulmonic valve, and a 2 cm mass on the superior surface. In addition, tumor was found invading the pulmonary artery out beyond its main bifurcation. Pathologic evaluation of these masses demonstrated that they were a myxoid chondrosarcoma with spindle cells. Review of the previous sections suggests that this is the same histology as that of the tumor removed from her knee in 1971.

Several features of this case will be commented upon. First, metastatic tumor presenting with cardiac symptoms is unusual. Second, the heart as the sole organ of metastatic involvement with sarcoma is very rare, especially 20 years after resection of a primary lesion. Finally, ante-mortum diagnosis and surgical removal of a metastatic chondrosarcoma to the heart is not well described in the medical literature and, therefore, we have had little guidance about clinical decisions. We will discuss additional complications and management of this patient.

12. CNS Aspergillus in a Non-Immunocompromised Host.

Joseph Pugleasa, MD, Roger Williams General Hospital, Joseph Friedman, MD.

A 24-year-old healthy Dominican woman presents with headaches, vomiting and photophobia. Past history included only depression and gonorrhea. Patient was normotensive, afebrile and in no distress. Bilateral papilledema was present. The remaining exam was unremarkable. Lab data: WBC 7500, with normal differential, electrolytes WNL, glucose 96 mg%. Lumbar puncture revealed opening pressure 400mm H_2O, Glucose 49 mg%, protein 92, WBC 291, 98% mononuclear cells and 2% segs. Cultures for bacteria, fungus and AFB were negative. HIV and T-cell subsets were negative as were cryptococcal antigen, VRL and cytology. Chest x-ray and non-contrast head CT were unremarkable. An MRI of the head revealed a non-aneurysmal abnormality adjacent to the basilar artery. An intermediate strength PPD was positive and the patient was started on triple drug therapy for TB.

The patient's symptoms persisted and her papilledema worsened. On hospital day 32, a left, subtemporal craniotomy was performed with biopsy of an extra-axial mass, which encased the basilar artery. A tenacious, white material was also removed from this area. Analysis of the biopsy specimen revealed inflammatory cells and branching hyphae. Cultures grew *Aspergillus* species. The patient was treated with itraconazole. Six months later, on therapy, she remains symptom-free with normal CSF.

This patient represents the first normal host reported to have developed aspergillus meningitis; and she is the first apparent cure with itraconazole, a benign, oral medication.

13. Controlling Cryptosporidiosis with Paromomycin A Case Report.

Anne Spaulding MD, (Associate), Miriam Hospital, and T Flanigan, MD.

GG is a 41-year-old Hispanic man with AIDS who developed severe diarrhea in September of 1991. The patient admits to IVDA a decade ago; the diagnosis of AIDS was made during a 1989 hospitalization for pneumocystis carinii pneumonia. On zidovudane, his most recent CD4 count was 55. Profuse watery diarrhea associated with nausea and vomiting commenced in early September and the diagnosis of cryptosporium was made on acid fast smear of his stool. Despite an October 1991 hospitalization for supportive care, the patient continued to deteriorate; the diarrhea did not remit. He was admitted to our institution November 4, 1991 after his weight loss totalled 30 pounds. Duodenal biopsy was positive for cryptosporidium; other enteric pathogens were absent in biopsy and stool studies.

Paromomycin is a poorly absorbed aminoglycoside which is effective in the treatment of another enteric protozoa, *Entamoeba histolytica*. GG was begun on paromomycin 500 mg QID 2 days before his November admission. On the medication, the patient's diarrhea diminished from 4-6 watery stools/day to 2 loose stools/day. He was discharged after a four-day hospitalization.

Despite evaluation of more than 60 different medications, no well-established therapy for cryptosporidiosis exists. A recent report on the use of paromomycin for gastrointestinal cryptosporidiosis described infrequent eradication of the organism but a substantial reduction in diarrhea, improved appetite and sense of well-being and a weight gain. GG has had a recent hospitalization for nutritional support. However, at present the diarrhea is less debilitating and the patient is able to live independently at home.

14. Tubulointerstitial Nephritis and Jejunoileal Bypass.

Joseph Spinale, DO (Associate), Miriam Hospital, and Rex Mahnensmith, MD.

DS is a 44-year-old male who underwent jejunoileal bypass surgery in 1972 for morbid obesity. He experiences 2-3 loose bowel movements daily. His past medical history is notable for a renal calculus approximately 3 years postoperatively, however, the composition of this stone was not determined. There was no history of arthritis. One year prior to admission an elevated serum creatinine of 2.7 mg/dl was noted and was presumed to be NSAID induced. NSAID's were discontinued but his serum creatinine remained elevated. A 24 hour urine collection for oxalate was elevated at 42.0 mg/24 hr (4.0-28.0 mg/24hr) and the patient was admitted for percutaneous renal biopsy.

Biopsy results revealed mild to marked perigiomerular fibrosis and severe focal intertubular fibrosis with associated severe tubular basement membrane thickening. Birefringent oxalate deposition was identified within the tubules and interstitium which was consistent with oxalate induced tubulointerstitial nephritis.

Hyperoxaluria leading to tubulointerstitial oxalate deposition can be casued by several pathogenetic mechanisms. These include endogenous enzyme deficiencies, increased intake of substances that are metabolized to oxalate, such as vitamin C, and increased GI absorption of oxalate. Intestinal absorption of dietary oxalate is limited to 5% to10% of intake by formation of insoluble calcium salts within the gut lumen. Malabsorption syndromes, such as Crohn's disease, bacterial overgrowth, blind loop syndrome and, as in this case, jejunoileal bypass causes increased fat within the gut lumen. This excess fat binds with calcium making it unavailable to form insoluble calcium oxalate. Under these conditions, oxalate absorption can increase to 35% to 40% of normal dietary intake. It has also been suggested that nonabsorbed bile salts may make the gut mucosa more permeable for oxalate absorption.

Our patient was treated with an oxalate poor diet, calcium carbonate supplementation and ion exchange resins. His serum creatinine has improved to 2.0 mg/dl.

15. Sudden Confusional State as the Presenting Feature of Acute Intermittent Porphyria.

Lee Jayson Stone, MD (Associate), Miriam Hospital, and Edward Feller, MD, FACP

An acute change in mental status as a sole manifestation of Acute Intermittent Porphyria (AIP) is extremely rare. Although a variety of psychiatric symptoms may occur in AIP, abdominal and neurologic symptoms usually predominate. The presentation of AIP can frequently be misleading. We report a case of AIP presenting with acute confusion.

A 61-year-old white female with a history of COPD and depression was hospitalized because of a sudden change in mental status. Medications included trazadone and Donnatal.

The patient appeared frightened and confused with a temperature 38.0 C, pulse 88, respiration 30 and BP 186/90. Mental status exam revealed pressured and stuttering speech, disorientation to time and place and inability to name objects. Neurologic exam demonstrated a fine Longue tremor, muscular rigidity, and a coarse resisting hand tremor. Physical exam also revealed a mildly tender abdomen without guarding.

Many diagnoses were considered. Evaluation included normal CT and MRI of the head, serum chemistries, coagulation profile, cell blood count, proteins C and S, cardiolipin, CSF, chest radiograph and EKG. Serum and urine tox screen were negative. EEG showed bilateral rhythmic slowing in both hemispheres without a localizing disturbance. A 24-hour urine amino-levulonic acid (ALA) was 12 mg (1.37-7.0 normal), porphobilinogen deaminase 44 (38-44) and porphobilinogen 0.4 (<2.0). Treatment consisted of high dose intravenous carbohydrate infusions. The patient's mental status improved dramatically by the third hospital day. Repeat ALA before discharge had normalized to 1.7 mg.

Physicians need to consider AIP as well as other organic disorders in the assessment of acute confusional states. The range of psychiatric symptoms in AIP includes agitation, confusion, depression, psychoses, delirium or can mimic conversion reactions. Clinicians should be aware of the psychiatric manifestations of this rare medical disorder. Diagnostic difficulties occur in the absence of the more typical constellation of abdominal pain and neurologic symptoms.

16. An Unusual Meningitis in an HIV Positive Woman.

Michi Yukawa, MD (Associate), Miriam Hospital, and Carol Garner, MD (Member)

The patient is a 26-year-old woman with a past medical history of positive HIV for 3 years, pseudotumor cerebri with insertion of a lumbar peritoneal shunt, hepatitis, Sturge-Weber Syndrome and PCP who presented to the ER with increasing dyspnea and progressive obtundation for approximately 48 hours.

Physical exam was notable for temperature of 37, BP 110/70, HR 84, RR 40. She responded only intermittently to voice commands. The patient had chemosis of the left eye with purulence in the anterior chamber, and had menigismus. Her lumbar peritoneal shunt site was without erythema or purulent exudate. Serum WBC was 7800 with 70% polys and 11% bands. Head CT scan was negative. Lumbar puncture was performed and cloudy fluid was obtained which had protein of 470, glucose of 12, and WBC of 129 with 90% polys. CSF was positive for Strep pneumoniae as well as for cryptococcal antigen (titers 1256). Blood cultures were also positive for Cryptococcus neoformans.

She was initially treated with ceftriaxone for bacterial meningitis, then amphotericin B was added when the CSF specimen was determined to be positive for cryptococcal antigen. The patient had a complicated 2 month course in the hospital, but was eventually discharged to home on oral fluconazole.

Cryptococcal meningitis commonly occurs in HIV positive patients. However, a literature search revealed no previously reported cases of HIV positive patients with meningitis caused by concurrent infection with two different organisms.

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A Statistical Profile of the Practicing Physicians of Rhode Island

Stanley M. Aronson, MD, MPH
Jay S. Buechner, PhD
Leonard B. Green, MPS

There are 2,350 licensed physicians actively engaged in the practice of medicine within Rhode Island.

The medical licensure division of the Rhode Island Department of Health bears a statutory responsibility for maintaining active records on the practicing physicians within the state. In compliance with this, the department requires all registered physicians to submit with their license renewal applications certain pieces of objective information including their age, address, primary and secondary professional specialty (and whether or not they are board-certified in each), number and names of hospital affiliations within the state, and whether the respondent holds a valid medical license in one or more states other than Rhode Island. In cooperation with the Rhode Island Department of Health, *Rhode Island Medicine* plans to share this summary data annually with its readership.

As of May 8, 1991, the department received 3,265 completed applications describing the licensure characteristics of the respondents. Respondents within any of the following categories were removed from the physician database: those with inactive licenses, those recently deceased, those who had not paid fees to maintain their licenses, those whose license was either revoked or held up for discipline, those declaring themselves no longer in practice, and those with home addresses not in Rhode Island, Connecticut, or Massachusetts (and hence, while licensed in this state, are unlikely to maintain a continuing practice in Rhode Island). After removing the names of those within the above categories, a total of 2,350 licensed physicians remain. Of these, 2,237 hold the MD degree (95.2%), and 113 the DO degree (4.8%). The American Medical Association (Department of Physician Data Services) publishes *Physician Characteristics and Distribution in the US*, their most recent volume summarizing their data for the year 1990. They list 2,760 physicians in Rhode Island but do not confine their numbers to those engaged in active practice. The AMA data also include federally employed physicians (eg, armed forces and Veterans Administration) such that numeric differences between the AMA and the Rhode Island Department of Health data are difficult to interpret.

On a nationwide basis, there are about 427 inhabitants for each licensed physician; in Rhode Island, the situation is somewhat better, with an average population base of 402 persons per licensed physician. Again, caution must be exercised in making comparisons since the category-definitions are somewhat different.

Table 1 summarizes the age distribution of the 2,350 licensed practicing physicians in Rhode Island. Of this number, 329 (14.0%) are below the age of 35 years and 228 (9.7%) are 65 years of age or older. How does this compare with a profile of practicing physicians throughout the United States? Among the 600,789 registered physicians within the United States, 23.1% are under 35 years and 15.0% are older than 65 years. In terms of age, then, a greater percent of the physicians of Rhode Island appear to fall within the middle decades of professional life (ie, 35-66 years) than do their national colleagues.

Table 2 summarizes the addresses provided by the respondent physicians. Of the total 2,350, 58 (2.5%) live in Connecticut and 228 (9.7%) live in Massachusetts. This table also lists the county, and occasionally the city, of the 2,064 physicians who list their addresses within the state of Rhode Island. If the numbers of physicians are equated with the populations of each of the five counties of the state, we arrive at widely varying physician-concentrations. In Newport County, for example, there are 752 persons for each registered physician. The state is sufficiently small, however, to permit persons to seek their medical care from practitioners in adjacent counties.

The declared primary specialty, and the declared secondary specialty (if any), of the 2,350 physicians of Rhode Island, and whether they are board certified, are summarized in Table 4. While the number of American specialty boards has remained the same in recent years (numbering 23, offering certification in 32 defined major specialties), the number of recognized subspecialties has risen dramatically. The American Board of Medical Specialties recognizes and, after appropri-

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Table 1–**Age Distribution of Rhode Island Licensed Practicing Physicians with Addresses in Rhode Island, Massachusetts, or Connecticut, 1991**

Age Group	Number	(Percent)
Under 30 Years	23	(1.0)
30-34 Years	306	(13.0)
35-39 Years	463	(19.7)
40-44 Years	380	(16.2)
45-49 Years	306	(13.0)
50-54 Years	239	(10.2)
55-59 Years	207	(8.8)
60-64 Years	198	(8.4)
65-69 Years	116	(4.9)
70-74 Years	73	(3.1)
75-79 Years	30	(1.3)
80-84 Years	8	(0.3)
85+ Years	1	(<0.05)
Total	2,350	(100.0)

Table 2–**Location of Address Provided by Rhode Island Licensed Practicing Physicians in Rhode Island, Massachusetts, or Connecticut, 1991**

Location	Number
Connecticut	58
Massachusetts	228
Rhode Island	2,064
Bristol County	100
Kent County	293
Warwick City	199
Rest of County	94
Newport County	109
Providence County	1,393
Cranston City	151
Pawtucket City	125
Providence City	796
Rest of County	321
Washington County	169

Table 3–**Number of Hospital Affiliations Reported by Rhode Island Licensed Practicing Physicians with Addresses in Rhode Island, Massachusetts, or Connecticut, 1991**

Number of Hospital Affiliations	Number of Physicians
None	364
One Hospital	890
Two Hospitals	566
Three Hospitals	336
Four or More Hospitals	194
TOTAL	2,350

ate fulfillment of requisites and examinations, provides certificates in 56 discrete subspecialties. There is substantial overlap. Hand surgery certification, for example, is now offered both by the boards in Surgery and Plastic Surgery. The boards of Radiology, Nuclear Medicine and Pathology each provide certification in nuclear medicine. Subspecialty certification in critical care medicine is offered by the boards in Anesthesiology, Internal Medicine, Neurosurgery, Obstetrics and Gynecology, Pediatrics, and Surgery. Only the board of Preventive Medicine offers certification in Underseas Medicine.

Of the 2,345 physicians responding to the question of primary specialty, 1,697 (72.4%) state that they are board-certified. The percent certified varies somewhat from specialty to specialty. It is generally more than 80% in most of the surgical subspecialties (eg, ophthalmology, orthopedic surgery, otolaryngology, plastic surgery, thoracic surgery, urology) as well as in general surgery. This is probably a reflection of most hospital bylaws within this state requiring board certification for operating surgeons. Of the major disciplines, only emergency medicine, with 78 physicians declaring this as their primary specialty, has a certification rate lower than 50%.

There are substantially more board-certified internists (323) than in any other specialty. Pediatrics (158), Family Medicine (119), Surgery (109), Obstetrics & Gynecology (107), and Psychiatry (106) each have more than 100 certified practitioners within the state. Rhode Island, the Ocean State, has no certified specialist in Underseas Medicine.

Of the 2,350 physicians in the analyzed database, 1,986 (84.5%) declared an affiliation with at least one hospital within Rhode Island. Nearly half of these physicians reported two or more affiliations (Table 3). A small number (194) stated that they were affiliated with four or more hospitals.

Table 5 summarizes the number of physician-affiliations for each of the 15 private, two public and two federally managed hospitals in the state. Rhode Island, Women & Infants, Roger Williams General, Miriam and Memorial Hospitals list the largest number of physician-affiliations.

The number of active medical licenses held in other states by Rhode Island's licensed practicing physicians is detailed in Table 6. At one numerical extreme, somewhat fewer than half of our physicians (46.9%) possess no other license. At the other extreme, 15 Rhode Island physicians claim licensure in five or more additional states. Table 7, lists, by state, the number of out-of-state medical licenses held by Rhode Island physicians. Massachusetts, New York, Connecticut, Pennsylvania and California lead the other states and territories.

Comment

The Rhode Island Department of Health plans to publish in *Rhode Island*

Table 4–**Primary Specialty, Secondary Specialty, and Board Certification of Rhode Island Licensed Practicing Physicians with Addresses in Rhode Island, Massachusetts, and Connecticut, 1991**

Board/Certificates (SS=subspecialty)	**Primary Specialty**		**Secondary Specialty**	
	Total	**Certified**	**Total**	**Certified**
Allergy and Immunology				
Allergy and Immunology	17	13	18	8
Diagnostic Laboratory Immunology (SS)*	0	0	1	1
Anesthesiology				
Anesthesiology	91	52	2	1
Critical Care Medicine(SS)*	1	0	5	2
Colon and Rectal Surgery	1	1	2	0
Dermatology				
Dermatology	41	31	2	1
Dermatopathology (SS)*	0	0	3	2
Emergency Medicine	78	37	28	3
Family Practice				
Family Practice	165	119	20	12
Geriatric Medicine (SS)*	7	1	16	12
Internal Medicine				
Internal Medicine	451	323	191	158
Cardiovascular Disease (SS)	58	44	47	17
Critical Care Medicine (SS)*	1	0	5	2
Diagnostic Laboratory Immunology (SS)*	0	0	1	1
Endocrinology & Metabolism (SS)	10	7	24	14
Gastroenterology (SS)	29	18	19	9
Geriatric Medicine (SS)*	7	1	16	12
Hematology (SS)*	24	16	15	7
Infectious Disease (SS)	14	8	11	5
Medical Oncology (SS)	11	8	26	11
Nephrology (SS)	11	8	7	6
Pulmonary Disease (SS)	19	14	27	17
Rheumatology (SS)	12	9	7	5
Neurological Surgery				
Neurological Surgery	25	17	0	0
Critical Care Medicine (SS)*	1	0	5	2
Nuclear Medicine	2	2	23	21
Obstetrics & Gynecology				
Obstetrics & Gynecology	141	107	11	3
Gynecological Oncology (SS)	0	0	3	2
Maternal & Fetal Medicine (SS)	0	0	5	2
Ophthalmology	68	58	0	0
Orthopedic Surgery				
Orthopedic Surgery	93	79	0	0
Hand Surgery (SS)*	0	0	4	0
Otolaryngology	34	29	2	2
Pathology				
Anatomic & Clinical Pathology	55	48	3	1
Anatomic Pathology	16	15	2	2
Clinical Pathology	3	2	9	6
Dermatopathology (SS)	0	0	3	2
Forensic Pathology (SS)	1	1	1	0
Hematology (SS)*	24	16	15	7
Immunopathology	0	0	1	1
Neuropathology (SS)	1	1	3	3
Pediatrics				
Pediatrics	184	158	37	24
Diagnostic Laboratory Immunology (SS)*	0	0	1	1
Pediatric Cardiology (SS)	2	1	3	2

Table 4– **Primary Specialty, Secondary Specialty, and Board Certification of Rhode Island Licensed Practicing Physicians with Addresses in Rhode Island, Massachusetts, and Connecticut, 1991** (cont)

Board/Certificates	**Primary Specialty**		**Secondary Specialty**	
(SS=subspecialty)	**Total**	**Certified**	**Total**	**Certified**
Pediatric Endocrinology (SS)	2	1	2	2
Pediatric Hematology-Oncology (SS)	2	1	2	2
Pediatric Nephrology (SS)	0	0	2	2
Neonatal-Perinatal Medicine	2	1	3	2
Physical Medicine and Rehabilitation	17	12	0	0
Plastic Surgery				
Plastic Surgery	15	12	1	0
Hand Surgery (SS)*	0	0	4	0
Preventive Medicine				
Aerospace Medicine	1	1	1	0
Occupational Medicine	3	2	8	0
Public Health and General Preventive Medicine	3	3	2	1
Psychiatry and Neurology				
Psychiatry	165	106	19	12
Neurology	41	31	23	11
Child Neurology	1	1	1	1
Child and Adolescent Psychiatry (SS)	19	9	23	11
Radiology				
Radiology	73	64	3	1
Diagnostic Radiology	37	30	1	1
Radiation Oncology	10	9	0	0
Nuclear Radiology (SS)*	0	0	3	3
Surgery				
Surgery	131	109	22	19
Pediatric Surgery (SS)	1	1	1	1
Surgical Critical Care (SS)	1	1	1	1
General Vascular Surgery (SS)	7	7	22	7
Thoracic Surgery	13	11	5	2
Urology	37	30	0	0
Other (Self-reported)				
Addiction Medicine	2	2	7	1
Clinical Pharmacology	0	0	2	0
General Practice	85	18	17	2
Nutrition	1	1	0	0
Not specified	11	7	38	14
TOTALS	2,345**	1,697	787**	456

*Subspecialty certified by more than one board and appearing more than once in table.

**Excludes 5 physicans not reporting primary specialty, 1,563 physicians not reporting any secondary specialty.

Table 5–**Hospital Privileges Reported by Rhode Island Licensed Practicing Physicians with Addresses in Rhode Island, Massachusetts, or Connecticut, 1991**

Hospital	**Number of Physicians with Privileges**	**Hospital**	**Number of Physicians with Privileges**
Bradley Hospital	34	Rhode Island Hospital	843
Butler Hospital	124	RI Medical Center General Hospital	44
Cranston General Hospital	86	RI Medical Center Institute of Mental Health	20
Kent County Memorial Hospital	209	Roger Williams General Hospital	403
Landmark Medical Center	160	South County Hospital	121
Memorial Hospital	302	St. Joseph Hospital	338
Miriam Hospital	384	Veterans Administration Medical Center	88
Naval Regional Medical Center	12	Westerly Hospital	89
Newport Hospital	107	Women and Infants Hospital	427
Notre Dame Hospital	27		

Table 6–Number of Medical Licenses Held in Other States by Rhode Island Licensed Practicing Physicians with Addresses in Rhode Island, Massachusetts, or Connecticut, 1991

Number of Other Licensure States	Number of Physicians
None	1,102
One State	834
Two States	271
Three States	95
Four States	33
Five or More States	15
TOTAL	2,350

Table 7–Number of Physicians Licensed in Selected Other States, by Rhode Island Licensed Practicing Physicians with Addresses in Rhode Island, Massachusetts, or Connecticut, 1991

State	Number of Physicians
Massachusetts	715
New York	234
Connecticut	156
Pennsylvania	106
California	90
Ohio48	
Florida	46
Maryland	45
New Jersey	42
Maine	38
Michigan	25
Missouri	25
New Hampshire	25
All Other States and Territories	273
TOTAL	1,868

Medicine a Rhode Island physician profile at yearly intervals. As the amount of data increases and the retrieval mechanisms improve, more demographic characteristics will be added to this annual summation.

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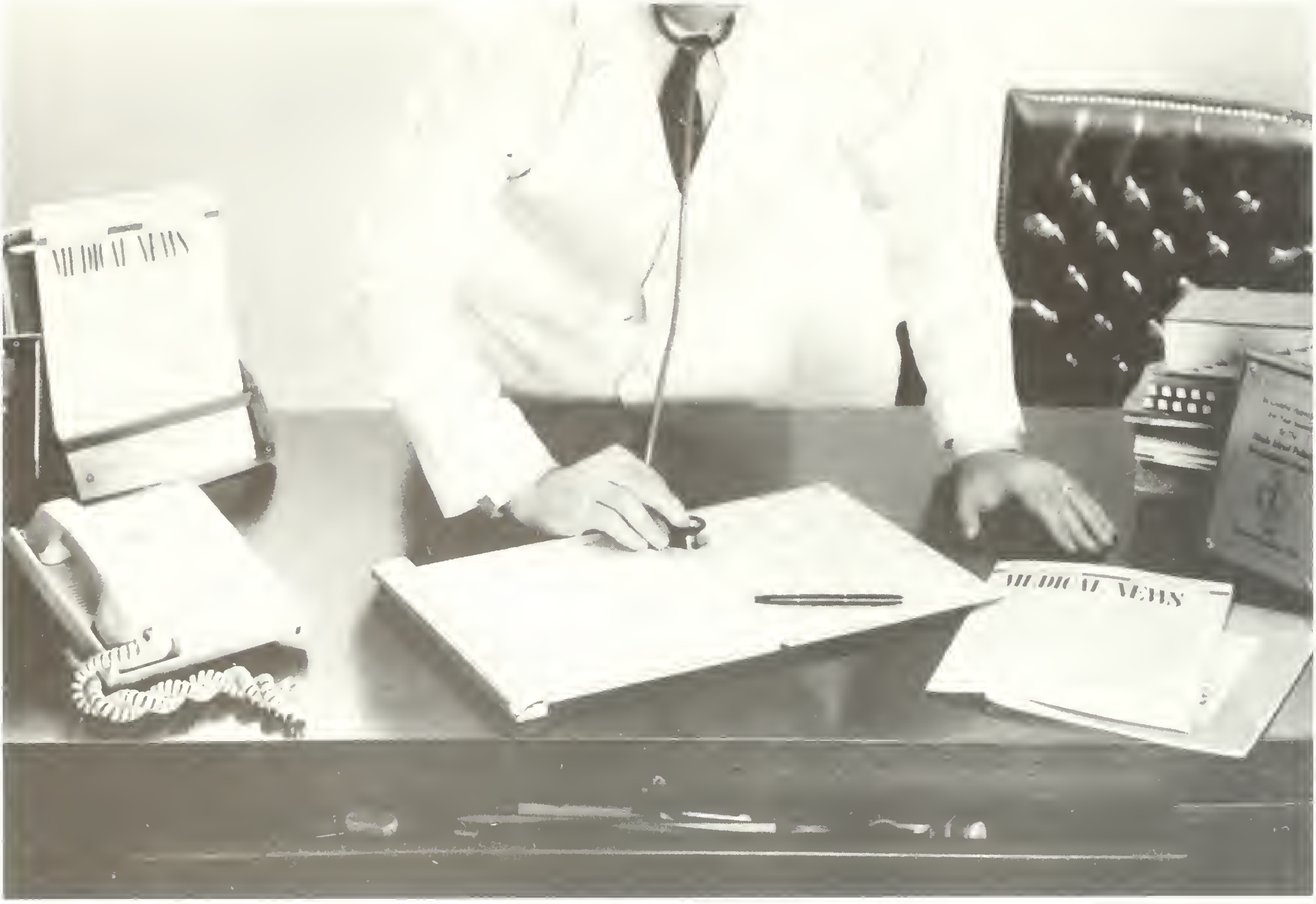

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Women in Medicine in the 1990s

Debra B. Abeshaus

Will women bring and renew a greater sense of caring and humanity to medicine?

In the 13th century, European "university trained physicians" were catapulted into a singular class that eventually replaced traditional women healers and midwives. Women healers were often classified as witches having dichotomous powers to heal yet harm in the process, and were looked upon disparagingly by the church and state. In the United States, women maintained a place in the healing arts as lay practitioners until the early 1800s, often sharing dual practices with their husbands.[1] During the same period a distinct group of "regular" doctors (who were male) emerged to handle the care of the middle and upper classes, and were soon noted as the predominant group legally licensed to heal. While the latter group had minimal "formal training," their education was an anomaly to medical science as we know it. Despite attempts of the "Popular Health Movement" in the US in the 1830s and 1840s that denounced medical elitism and was closely linked to working class and feminist movements, the formation of the American Medical Association in 1848 further restricted efforts of women and lay practitioners.[2]

Today, 150 years later, a new era exists, and women are electing medicine as a career in greater numbers than ever before. Some question if the current wave of women moving into medicine will affect health care in the United States, while others wonder how long it will be before women become an integral part of the medical hierarchy. This article addresses the topic of women in medicine by looking at the current literature in three areas: 1) the statistics that reflect the increasing numbers of women physicians in the United States over the past few decades; 2) the challenges facing women who select medicine as a profession; and 3) the resources available to support women physicians and their advancement within a field where the leadership and professional role models historically have been male.

What are the actual numbers of women who have entered the medical profession since the 1970s?

The statistics that reflect the increasing entry of women into the field of medicine since the early 1970s are indicative of many trends. Most revealing is that since 1970 the number of women physicians has increased 387% as compared to an increase of 163% for men.[3] The steady increase in the number of women in medicine appears to be here to stay, at least for the next two decades.

The number of women applicants to medical school dramatically increased from the academic year 1969-70 (9.4% of total applicants) to 1974-75 (20.4% of total applicants). In 1984-85, the number of female applicants represented 34.7% of total applicants. The percent of women in the total applicant pool has continued to rise in subsequent years through 1989-90 (39.2%). In 1990-91, women accounted for an estimated 40.2% of all applicants to US medical schools.[4]

That the percent of women applying to medical school increased significantly between the period of 1974-75 to 1989-90 is evident by the increased number of women matriculants in medical school during that same period. In 1974-75, women constituted 18.1% of the total number of student enrolled in US medical schools. By 1989-90, the percent of women enrolled in medical school had doubled to 36.2%. In 1974-75, women constituted 13.4% of all graduates from medical school, increasing to 33.4% of all graduates in 1988-89.[4] At the Brown University School of Medicine, women currently constitute 41% of medical students and 46% of the students enrolled in the early years of the Program in Liberal Medical Education (the 8-year combined degree program that leads to the bachelor's and MD). In May 1991, women con-

ABBREVIATIONS USED:

AAMC: Association of American Medical Colleges
JAMWA: Journal of the American Medical Women's Association
SUNY: State University of New York

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stituted almost half (48.7%) of the Brown MD graduating class.[5]

A report in the *American Journal of Public Health* (March 1990) predicts that the continued growth trend of women in medicine that began in 1970, will continue to rise until 2010 and will significantly affect the future supply of physicians in the US. The authors' projection assumed that: 1) the proportion of women graduates of US medical schools will reach 40% in the mid-1990's and will remain steady at that point; 2) male and female MDs will continue to choose specialties patterned after the most recent medical school graduates; and 3) retirement and mortality rates of male and female physicians will remain unchanged from their current rates.[6]

By the year 2010, the same study indicates that women physicians will account for 30% of all physicians. Women will continue to be highly represented in pediatrics and psychiatry and underrepresented in surgery and surgical subspecialties. However, among the younger cohort of physicians entering the profession, the authors find specialty distribution between males and females is likely to become more similar. In fact, they point to an "index of dissimilarity for the specialty distributions" (percent of female physicians who would need to change specialties to match that of male physicians). Between 1970-1986, that index dropped from 31.2% to 23.7%. For female physicians under 35 years of age, the percent dropped from 28.5% to 18.4% for the same years.[7]

By the year 2010 . . . women physicians will account for 30% of all physicians.

Looking at number of hours worked per week by male and female physicians, Kletke, et al found, as other studies have indicated, that male physicians work more hours per week than female physicians. However, they differ with some researchers who find rapidly growing numbers of women entering medicine may lead to an overestimation of the projection for effective physician supply in the coming years. They reached this conclusion by studying "active patient care" by physicians and projected that between 1986 and 2010, female physicians who will comprise a high proportion of the physician population will be entering "middle age categories, when they spend the most time in patient care."[8] At the same time, male physicians will be entering the older age categories, and they will be spending fewer hours per week in patient care. In addition, even though women physicians have higher retirement rates than male physicians, their anticipated working lives are almost as long as male physicians because women live longer. The authors conclude that the changes in "the physician population will reduce the growth of the effective physician supply between 1986 and 2010 but only by four percentage points."[9]

A perspective on current changes in the applicant pool to medical school is offered by Arnold Relman, MD, editor of the *New England Journal of Medicine* who suggests a reason for fewer white males entering medicine. He thinks it is primarily due to "the rising cost of medical education and a growing concern about future professional autonomy and economic opportunity."[10] Dr Relman notes that for women, who comparatively have "shown a greater preference for salaried practice and less remunerative specialties," issues of "professional autonomy" and "economic opportunity" may not have been as prominent in their career choice. He also points to the prevailing pattern of women electing "primary care specialties as obstetrics and gynecology, and psychiatry more frequently, and all of the surgical specialties less frequently than men." Dr Relman identifies an essential goal for medicine in the 21st century when he says that physicians will need to become more aware of "the social and economic problems of health care " in the future, and commit in great numbers to the primary care specialties (or else "be forced to accept the arrangements imposed by third-party payers").[11]

There are a limited number of role models for women in medicine and in scientific research.

Some observers foresee that women will meet the need for MDs in the area of primary care in the coming years and welcome the current specialty selection preferences among women. Others have suggested that women's pattern of entering primary care specialties reflects their socialization as women, ie emphasis is on relationships with others; female "care perspective" vs male "justice perspective" as psychologist Carol Gilligan defines it.[12] Again, this may be another reason why many women lean towards primary or family-centered care. Ultimately, there is a need to collaborate and focus on promoting and valuing the participation of both women and men in all medical specialties.

What challenges confront women who select medicine as a profession?

Research on the challenges that women physicians face appear to be distributed into four areas: 1) In addition to their professional responsibilities, women are frequently the primary caregivers for the family (ie, responsible for child-rearing and household activities). This is often the cultural norm not only for women physicians but for women in general. 2) There are a limited number of role models for women in medicine and in scientific research. 3) There is inadequate access to women mentors in academic medicine on strategies for advancing in the system. 4) For women interested in pursuing academic careers in medicine, alternatives to the traditional timetable to meet promotion/tenure requirements are rare.[13]

While women comprise only "one sixth of all MDs, the ratio of females to males will continue to rise each year," notes Carola Eisenberg, MD. "Medicine is no longer an overwhelmingly male profession," says Eisenberg. In fact, she finds that with the decline of male applicants to medical schools from 1984 to 1989, the increase of women applicants to medical school preserved the integrity and size of the overall applicant pool. In view of the "new demographics of the medical profession," attention must be paid to policies for parental leave and day care (from medical school through practice within a group setting or hospital environment).[14]

Eisenberg concurs with other researchers who have found that the majority (71%) of women physicians in academic medicine hold "lower level" appointments of rank (ie, assistant professor and below). She further points to a study, noting that of those MDs appointed to faculty positions for the first time in 1976 and promoted to full professor by 1987, only 3% were women vs 12% men.[15] While Eisenberg notes data from other studies suggesting limited research training and publications by women as two factors for this difference, she finds the current situation unacceptable and sees the only way out through "affirmative action." For example, she advocates that tenure slots should be filled by a woman candidate when both men and women have equal qualifications. However, she comments that problems arise when two "equal candidates" are compared on their record of publications and sometimes on the magnitude of projects that the candidates have handled. Since the female candidate may not have published as much nor been offered the opportunity to oversee certain administrative projects, she is at a disadvantage.[16]

Without an informal network to rely on, paths leading to higher-level positions in academic medicine often are precluded for women. The importance of role models or mentors is critical. Women physicians who are interested in advancing in the academic system need to be urged to seek out mentors and to familiarize themselves with promotion criteria within their department. In disseminating information and providing opportunities for women to take on key administrative responsibilities positive changes for women will be effected.

The results of a national survey conducted by three physicians (W Levinson, S Tolle and C Lewis) on attitudes of women MDs in academic medicine detail some of the challenges that women physicians encounter. Specifically the study focused on how women in academic medicine perceived the balancing act of juggling career and family, ie, childbearing/childrearing, personal and professional issues and role models. The authors thought their study may prove useful to "women early in their academic careers, who often lack role models at their own institution."[17]

Women physicians who are interested in advancing in the academic system need to be urged to seek out mentors and to familiarize themselves with promotion criteria within their department.

The women surveyed were full-time faculty (with the exception of a few who were part-time salaried or voluntary clinical) in departments of medicine, and were 50 years of age and under. The mean age of those responding was 38.1 years, and 63% had children. The authors estimate that nearly "half of the respondents with children had their first child after completing medical training (mean age 30.6 years) and were absent from work for a median of 6 weeks post partum; 72% took no time off before labor and delivery and 83% were back to work within 12 weeks." Seventy-eight (78%) of those respondents with children indicated their career advancement "had been slowed or markedly slowed by their having children."[18] (The challenge of finding sound day care is also addressed here.) Eighty percent of the women had training in a medical specialty while 20% were general internists. Most (86%) were certified in internal medicine, and 60% of those women were certified in a specialty as well (most common were oncology and hematology, cardiology, nephrology, immunology and rheumatology). The majority of respondents divided their time on patient care, teaching and research. Twenty percent devoted 50% or more of their time on research. A mere 4% spent half or more of their time on administration.[19]

Considering the issue of role models, 94% of the respondents agreed that women medical students need them, pointing to the necessity for role models with tenure. Of 61% who reported a mentor relationship during training, 53% noted the mentor was male, 11% had had female mentors, and 36% reported both men and women mentors. Those with mentors indicated greater career satisfaction than those who did not have them. The small percentage of women reporting female mentors is indicative of the dearth of women faculty at advanced ranks in academic medicine at the time of the respondents' training. Some agreed that "it was difficult to find a role model who was perceived as successful in both career and personal life." Few women noted options for shared positions as faculty members or residents, and only about 40% were aware that their institution had a "formal policy" on maternity leave for faculty members. The authors conclude their article by commenting that they "studied the system's survivors," and emphasized the need to examine more closely those women who have left academia or have elected to work part-time.[20]

Before looking at the resources available to women in medicine, one additional challenge must be acknowledged: the challenge to rectify the inequities in pay between males and females confronts working women in all spheres. A series of articles that appeared in the *New York Times* last year by LK Altman and E Rosenthal, on the changing profession of medicine included data on the differential between incomes of female and male physicians. While there has been a slight narrowing of this gap in recent years, the authors note: "In 1987, male physicians practicing 20 years or more earned an average of $172,200 vs women physicians who earned $72,800." More pertinent to the way things stand today, "among doctors practicing 4 years or less, men earned $110,600 and women earned $74,000."[21]

In the same series Joyce Davidson, MD, a psychiatrist at the Meninger Clinic in Topeka, Kansas, who studies issues related to women in medicine, notes that women doctors earn an average of 30% less than their male colleagues (at the same level). She points to the additional stresses (responsibilities of family/household, biases toward women in the field) that women physicians face and finds that more than 50% experience a major depression during their career. Also, she notes their divorce rate is 48% higher than the norm for all women. Optimistically, she finds women' s entrance to the field of medicine a positive one, bringing to the forefront the need to look at alternatives to traditional patterns as the grueling "round the clock" schedules of physicians.[21] Finally, on the issue of equal pay for women physicians, there is a recurrent theme: one reason female physicians are paid less than male physicians is due to their specialty choice. Also, female MDs "practice fewer hours per week and are less likely to receive professional awards or to serve on professional committees."[22] Women's representation in certain specialties often is limited because of difficult access to predominantly "male specialties." Providing mentoring and leadership opportunities to women who demonstrate an affinity for or interest in a particular medical specialty are two ways to begin to ease the boundaries.

> *. . . among doctors practicing 4 years or less, men earned $110,600 and women earned $74,000.*

What are the resources currently available to support women in medicine at all levels, (ie, medical students, residents, faculty, physicians in private practice)? What kinds of programs and institutional policies can be established to facilitate the advancement of women in the field of medicine?

There are several national organizations that focus on networking women in medicine at various points in the spectrum – from medical school through medical practice. For those women in academic medicine, one of the key national networks is offered by the Association of American Medical Colleges (AAMC) in Washington, DC. Within the AAMC Division of Institutional Planning and Development, there is an assistant vice president for women's programs, Janet Bickel, who writes a quarterly newsletter for women in academic medicine, *Women in Medicine Update*. The newsletter is distributed nationally to women liaison officers, department chairs and deans at each medical school, to section chiefs at university affiliated hospitals, and to women liaison officers representing the Council of Teaching Hospitals.

There are many medical schools across the country that have programs and offices for women in medicine. The distinction between program and office is not defined, though the latter minimally includes a part-time director, space and budget. Brown University is one of eight medical schools that have separate offices for women. The other offices are located at Yale University, Cornell University Medical College, SUNY Buffalo, Northeastern Ohio Universities College of Medicine, University of Southern California School of Medicine, Harvard Medical School, and Temple University School of Medicine.[23]

The *Journal of American Medical Women's Association* (*JAMWA*) published bimonthly by the American Medical Women's Association, is another valuable resource for women in medicine. It promotes the status of women physicians by addressing women's health issues and providing a forum for women to publish their medical research on women's health care. In addition, articles on professional issues pertinent to women in medicine are included in each issue. The board of directors for the publication includes representatives from geographic regions across the US, including a representative of national student coordinators.

> *More than 50% of women physicians experience a major depression during their career. Also . . . their divorce rate is 48% higher than the norm for all women.*

Two recent articles published in *JAMWA* are worth noting when considering instituting policies to create opportunities for women in medicine. One, published in the January/February 1990 issue, outlines a study by the Dependent Care Task Force (appointed by the AMWA president) that reports on day care programs in the teaching hospital setting. It looks at a new alternative to accommodate the child care needs of working parents on the staffs of universities and their affiliated teaching hospitals.[24] The other article, "Part-Time Doctors: Reduced Working Hours for Primary Care Physicians" (March/April 1990), is a study by three women physicians (R Wheeler, MD, L Candib MD, and M Martin, MD) who had worked as "part-time" family physicians in an academic community health center. They present the option of working part-time for physicians and recommend specific strategies for those individuals and institutions considering this alternative. Here part-time is defined as reduced working hours: 30-40 per week, to enable the employee to handle other major responsibilities, ie, family, household management, continuing education and community work. The authors cite a study by Lorber that predicts more male MDs will be part of dual physician couples in the future and will be interested in reduced working hours. Also, they note studies indicating that young women physicians' early career selection may be affected by their interest in managing working hours later on.[25]

Turning to specific policies that institutions can develop and implement to balance the scales for women in medicine, three areas are key. One is maternity leave as described by Wendy Levinson, MD et al in the *New England Journal of Medicine*, November 1989. The authors suggest: "Formal policies like those designed or sabbatical leaves would probably help to meet the needs of both women physicians and their colleagues during the postpartum period."[28] A second is the opportunity to share jobs (one full time position filled by two employees). A third concept is a slow track leading to tenure designed specifically for those (both men and women) who would be allowed additional time "to achieve standards for promotion and tenure."[26] Also a number of universities have implemented "stop-the-clock" programs that allow women raising children to have tenure decisions delayed.[27]

As to the issue of whether the influx of women in medicine will create new approaches to patient care, some have pointed to a shift towards a model of care where the doctor/patient relationship is more egalitarian.[28] There is a movement in this direction by other physicians and health care providers as well. This is yet another area that needs to be tapped and explored more fully. Will women bring and renew a greater sense of caring and humanity to medicine? Carol Gilligan addresses this point when she writes, "As medical schools seek to improve and humanize medical education, support and confirmation for women may bring about a different perspective on what constitutes achievement, power and affiliation."[29] Eisenberg notes that we need to nurture "humanistic qualities" in both sexes, and create a system that insures such standards of care.[30] One recent study that examined gender bias in clinical decision-making, particularly related to cases involving availability of kidney transplants, diagnosis and treatment of cardiac disease and diagnosis of lung cancer, suggests that more women physicians in the upper ranks of medicine could improve medical care of women patients.[31] More studies in the area of women's health need to be carried out. With the establishment by the National Institutes of Health of the new Office of Women's Health Research, gender role in scientific research will be moved to the forefront.

. . . young women physicians' early career selection may be affected by their interest in managing working hours later on.

Conclusion

In overview, increased numbers of women physicians are changing the demographics of medical practice in the United States. The magnitude of the percentage of women entering medicine impels medical schools and their affiliated teaching hospitals to address policy and career development issues that concern this growing population of medical students and practitioners. For example, programs to counsel women medical students and residents, and to better inform them of opportunities of advancement need to be put forth. Also, maternity leave policies need to be defined, as well as plans for quality day care facilities/services to support working parents, both men and women. Until programs and policies are established to enable women physicians to attain positions of leadership where they can influence the status of women as health care providers and patients, and ultimately serve as the new role models for the younger cohort following them, their participation, progress and contributions to the medical profession will be limited.

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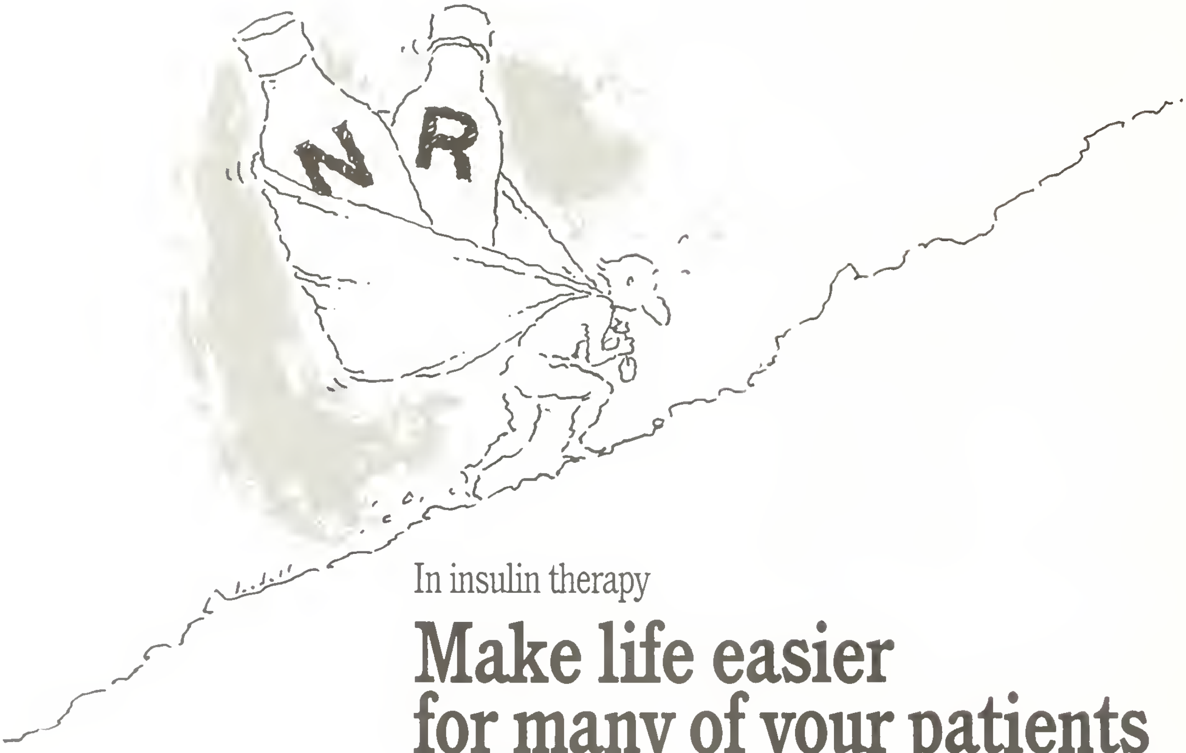

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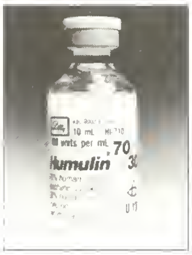

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HEALTH BY NUMBERS

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Hospitalizations with Head and Spinal Cord Injuries

Non-fatal head and spinal cord injuries are of particular concern to injury prevention and control programs because they are among the most likely injuries to result in long-term physical and mental disabilities. From October 1, 1989 through September 30, 1990 there were 697 discharges from Rhode Island hospitals with a principal diagnosis of a head injury and 28 discharges with a principal diagnosis of a spinal cord injury. (Discharges where the patient was transferred from another acute care facility and discharges where the principal diagnosis was a late effect of an injury were excluded to avoid double counting of cases.) Of the 697 head injury discharges, 204 (29%) involved skull fractures and 493 (71%) were concussions, intracranial hemorrhages due to injury, and cerebral lacerations and contusions (see Table 1). Conversely, of the 28 spinal cord injuries, the majority (64%) involved fractures.

The age-sex distributions of cases with the two types of injuries are similar and reflect the classic pattern of injury incidence . Both have a principal peak among persons between 15 and 24 years of age and a secondary peak among the very elderly (Figure 1). Males outnumber females among cases below age 65, constituting 75% of cases in that age group and 72% of cases overall. Above age 65, females represent 60% of cases with these injuries, consistent with their proportion among the elderly population of Rhode Island.

Although there are fewer persons hospitalized with spinal cord injuries than wih t head injuries, they appear to be more severely injured in general than head injury patients. Hospitalizations for spinal cord injury had a median length of stay (LOS) of 15 days, and 29% extended for more than thirty days. For head injuries, the median LOS was 3 days, with only 7% staying more than 30 days. Spinal cord injury patients were also much more likely (61%) to have three or more co-existing diagnoses reported than were head injury patients (45%). Finally, spinal cord injury patients were more likely to be discharged dead (11%) or to further care situations (50%) than head injury patients (7% and 17% respectively) (Figure 2).

Cause of injury information was reported for 442 (63%) of the 697 head injury discharges and only 11 (39%) of the 28 spinal cord injury discharges. (During this period, reporting of cause of injury codes was required for all injury hospitalization under state regulations governing discharge data submission by the hospitals.) For head injury discharges, the leading causes of injury were motor vehicle collisions (42%) and falls (37%), with assaults the only other cause with a substantial proportion (11%) (Figure 3). Among motor vehicle collisions, the numbers of head injuries involving pedestrians, bicyclists, and motorcyclists suggest these groups are at especially high risk for such injuries. Information on the nature of falls causing head injuries is not as specific, with stairs being the only contributing factor identified in a large number of cases (37 of 161 falls).

Information on the cause and outcomes of injuries, such as that presented here, is used to identify risks and plan program interventions. To address head and spinal cord injuries, the Department of Health's Injury Prevention Program supports safety belt and motorcycle helmet legislation, promotes bicycle and motorcycle helmet use and child safety seat use, and funds many community-based injury prevention projects addressing such issues as falls among the elderly and playground falls. In addition, the department's newly-established Disabilities Prevention Program includes a component focusing on head and spinal cord injuries, which targets motorcycle, bicycle, and playground injuries.

Submitted by the Injury Prevention Program, Thomas W. Largo, MPH, Epidemiologist, Ann Thacher-Renshaw, MS, Project Director. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr, PhD.*

Table 1–**Principal Diagnosis for Discharges with a Head Injury or a Spinal Cord Injury, Rhode Island, 1990**

Principal Diagnosis	Number of Discharges
Head Injury	697(100%)
Fracture of skull (excluding face bones)	204 (29%)
Other intracranial injury	493 (71%)
Spinal Cord Injury	493 (71%)
Fracture of vertebral column with spinal cord injury	18 (64%)
Other spinal cord injury	5 (18%)
Injury to nerve roots and spinal plexus	5 (18%)

Figure 1–**Hospital Discharges with a Head Injury or a Spinal Cord Injury by Age Group and Sex, Rhode Island, 1990**

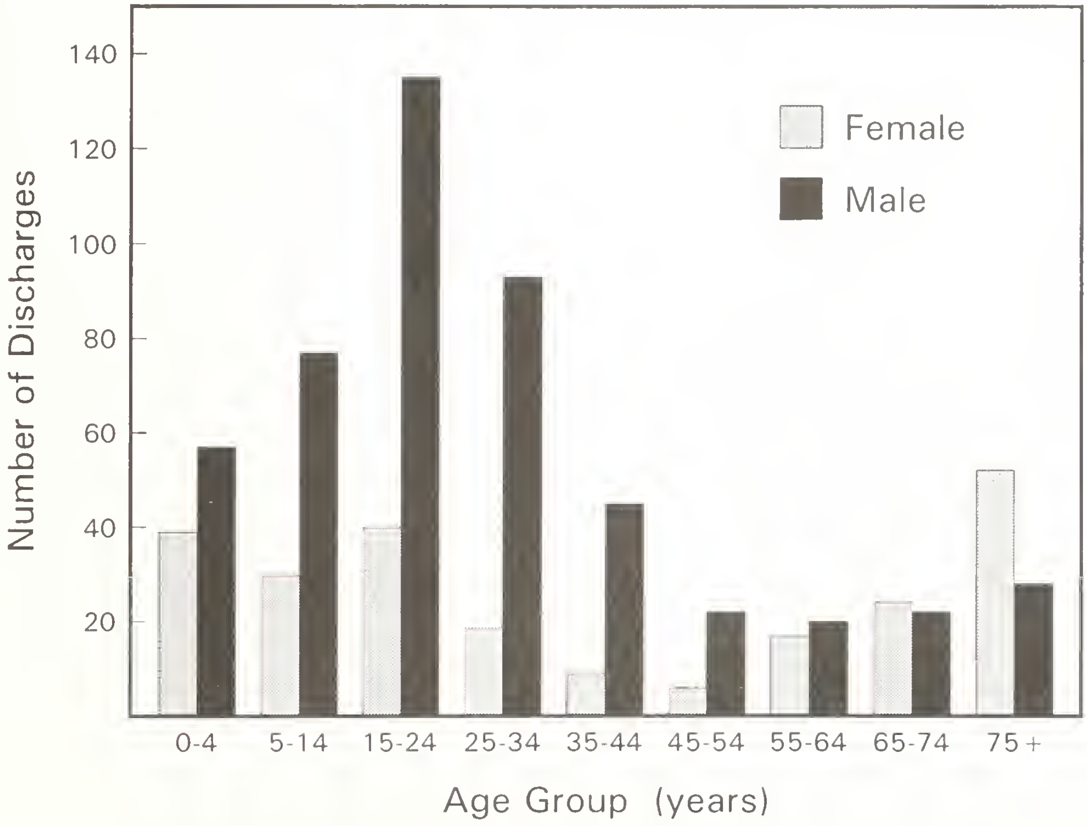


Figure 2–**Distribution of Disposition at Discharge for Hospital Discharges with a Head Injury or a Spinal Cord Injury, Rhode Island, 1990**

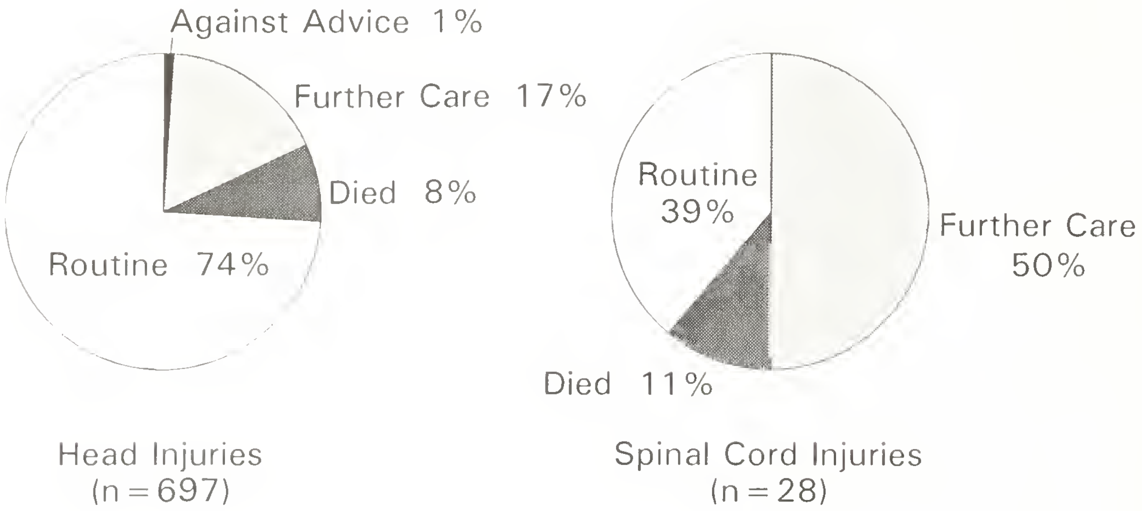
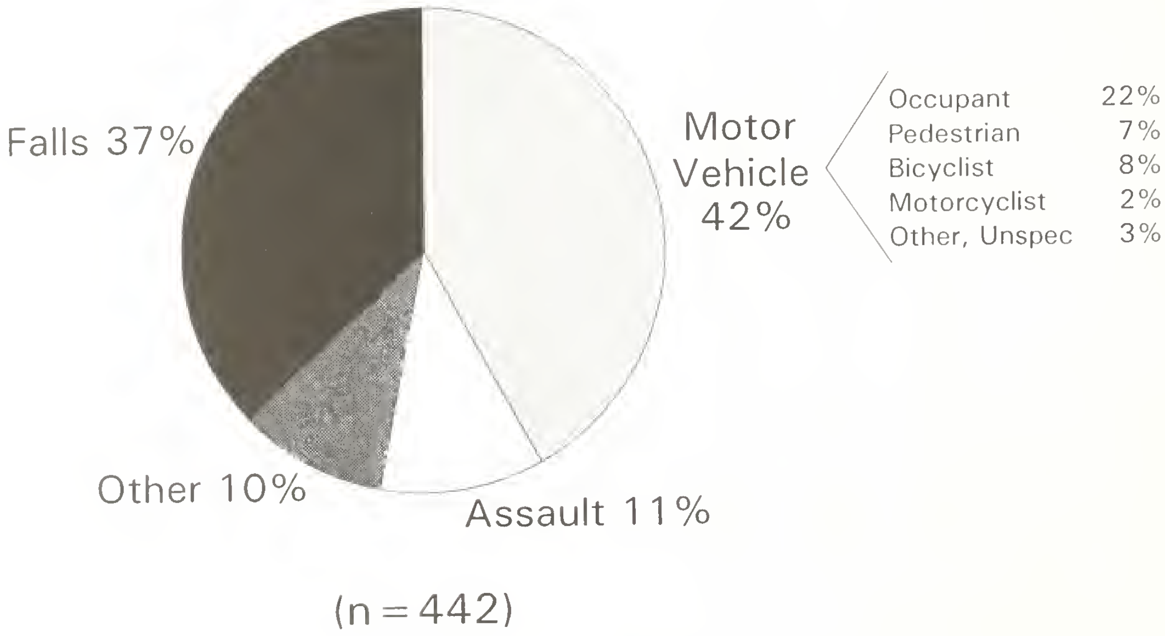


Figure 3–**Distribution of Cause of Injury for Hospital Discharges with a Head Injury, Rhode Island, 1990**



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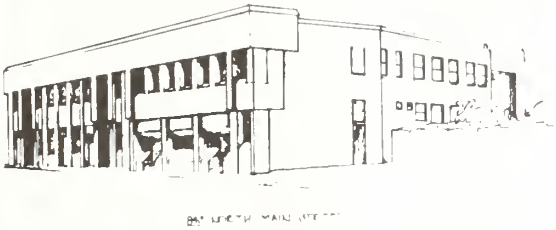

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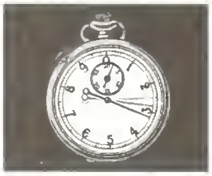

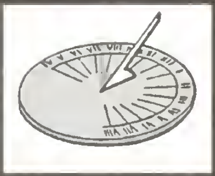

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1. A. Morales et al., New England Journal of Medicine: 1221. November 12, 1981.
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p. 176-188. McMillan December Rev. 1/85.
3. Weekly Urological Clinical letter, 27:2, July 4, 1983.
4. A. Morales et al., The Journal of Urology 128: 45-47, 1982.

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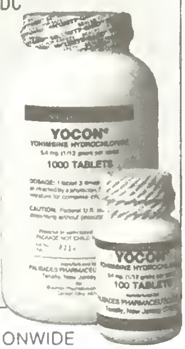

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BOOK REVIEW

Uneasy Endings. Daily Life in an American Nursing Home. Renée Rose Shield, PhD, 243 pages. Cornell University Press, Ithaca and London, 1988.

Leave it to a cultural anthropologist with expert knowledge of social structures and a keen eye for the pungent character vignette to tell us what is really going on in a nursing home, replacing benign fiction with hard fact and insightful commentary. Much of the text represents the recorded words and observations of nursing home staff and residents.

Being a clinical assistant professor of community health at the Brown University School of Medicine provides Dr Shield with yet another angle from which to illuminate the whole picture of nursing home life. Her skillful pen reflects her growing up in, and being part of, a family of fine writers.

Observations on generational continuity are the driving forces behind her book. Her first sentence reads: "The life cycle is truly a cycle . . . I came to the study of nursing home residents out of the dawning understanding of my own aging." And in stark contrast to the warm cocoon that characterizes an intact family of many generations, she describes, with devoted attention, the disconnected lives of those assigned to nursing homes, and those who work there: An extended, but not a real, family.

Three theoretical ideas are at the core of this text. The impersonal organizational necessities that account for the harsh, systemic reality of the place; the passive and receiving role of the residents; and the grim situation of being, "without anchor in a rite of passage between adulthood and death . . . The nursing home existence is a long transition seemingly endless and without goal." While she succeeds in maintaining the required scientific distance and objectivity, Dr Shield's humanity invariably shines through. Piercing through the layers of realistic institutional problems, people's feelings and behavior, the constant two-way exchanges between residents and staff comes fully alive. In essence they are you and me, only much more so in this unique situation.

Observations are sharply etched, but always caring, and never critical. From the nursing assistant who, made aware of a spill, replies, "I don't mop," to the one who cannot say enough how much "inner joy it gives me to take care of the needs of the elderly" and "to treat them with love and respect," – it is all there.

To maintain a precarious balance between administrative and budgetary restrictions and human needs, between the institutional imperatives and the desire to preserve the individuality of so many elderly people, seems a well nigh impossible task. The author, like everyone else, does not propose any easy solutions, but nevertheless presents numerous constructive ideas for improving the resident's quality of life. She suggests ways of handling their "rite of passage with few if any rituals" by facing more candidly and kindly the unavoidable reality of impending death; of enhancing their participation in the dynamics of their personal view and of increasing their sense of purpose and self-worth. With informative, scholarly insight into the historical background of sheltered care, she points toward possible ways of making progress.

This is too rich a book to do justice to in a short review. If you want to know more, you'll have to read it. You will find it as sobering as it is enlightening.

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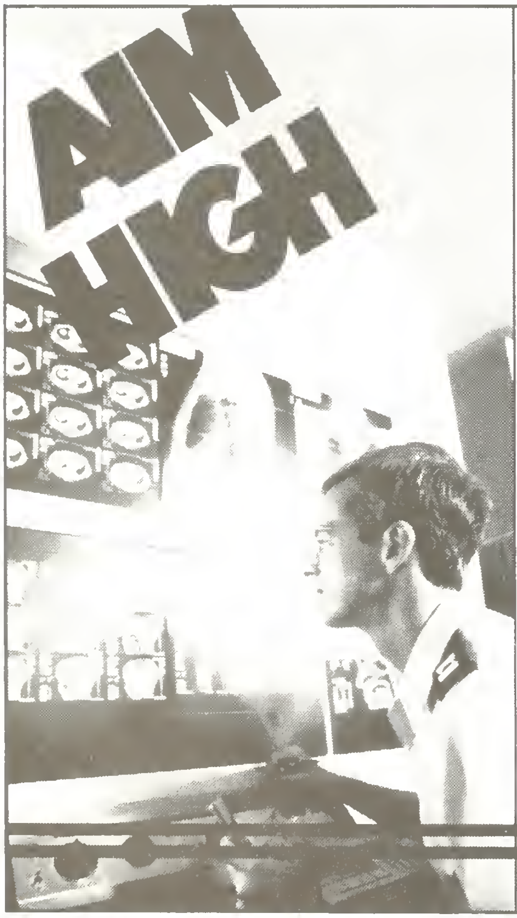

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

Ninety Years Ago
(July, 1902)

The lead editorials describe the scientific content of the annual meetings of the American Medical Association and the American Academy of Medicine. The 1902 meeting, held in Saratoga Springs, NY, is distinguishable by the first gathering of the new AMA House of Delegates, the future legislative and business branch of the association. The academy presented seminars on subjects such as: The Political Side of Medicine; The Profession and Social Reform; Compensation for Medical Service Rendered to the State; Medical Representation in Hospital Management; May Hospitals Steal?; Good Vision as a Factor in the Education Process; and Children in Cities.

Another editorial provides philosophic reflections on a quiet street, referring obliquely to the various sounds one hears on a peaceful residential street in Providence. The most dramatic, in the view of the writer, are the sounds of firecrackers set off by young boys celebrating the Fourth of July. He notes: "This short Reign of Terror is dreaded by many people who are too old or too weak to take part in it, but most of us remember the time when we enjoyed just this same irrational and fiendish pleasure, and are bound to condone the offence (sic). The physiologist can perhaps explain why man requires his days of Saturnalia. In some parts of our South it is Christmas Day that is saluted with the firing of muskets and general noise making." The writer then describes other sounds heard on his otherwise quiet street: the church bells ringing a vigorous Angelus; the fish peddler blowing his horn; the hurdy-gurdy and street organ men; the ice-cream peddlers with their gongs, making their last round about midnight.

The first of the original communications presents remarks on diphtheria offered by John H. McCollum, MD, of Boston. He notes that the reporting of each case of diphtheria was required in Massachusetts since 1878. The number of deaths in Boston from this infection has since varied from a low of 172 (1901) to a high of 817 (1894). The mortality rates, each year, have also ranged from 10% to 35.7%. The dramatic reduction in case fatality rates since 1895 can only be explained by the city-wide access to antitoxin therapy begun in that year. (Before the advent of antitoxin intervention, the mortality rate from diphtheria varied from 30% to 50%.) The mortality rates for this disease are typically higher in very young children and in the elderly. The involvement of the larynx (requiring intubation and tracheotomy) increases the mortality rate; before antitoxin the mortality rate for this extended form of diphtheria was as high as 87% (and after antitoxin usage, 38%). What dose of antitoxin? "In the case of a patient ill with diphtheria, there is no way of estimating the quantity of toxin generated by the membrane and, therefore, one must administer the agent until the characteristic effect is produced, viz, the shriveling of the membrane, the diminution of the nasal discharge, the correction of the foetid odor and a general improvement in the condition of the patient."

On the basis of experience with 10,526 cases of diphtheria seen in this hospital during the prior 7 years, the author draws the following conclusions: (1) The ratio of mortality of diphtheria per 10,000 of the living was very high in Boston before 1895; (2) The ratio of mortality per 10,000 has been reduced materially since the introduction of antitoxin; (3) The percentage of mortality in the South Department is lower than any of the hospitals taken for comparison; (4) Since larger doses of antitoxin have been given, the death rate has been materially reduced; (5) No injurious effect has followed the use of the serum and (6) To arrive at the most satisfactory results in the treatment of diphtheria, antitoxin should be given at the earliest possible moment in the course of the disease.

Fifty Years Ago
(July, 1942)

The lead article is the presidential address by the newly-elected president of the Rhode Island Medical Society, Charles F. Gormly, MD. It is entitled "Medical Rationing" and discusses the most pressing current problem facing the physicians of Rhode Island, namely, the impending shortage of practitioners to care for the civilian population. Given the fact that virtually every physician younger than 45 years will be in military uniform and with no possibility of physician-replenishment, some planning for non-military wants becomes mandatory. The armed services, incidentally, expects to recruit about 2,000 physicians before the completion of 1942. The writer states: "My own best guess is that there would normally be about 800 doctors of medicine practicing in Rhode Island. Therefore with a minimum of 200 in service it can be definitely stated that a deficit of 25% will exist by January 1, 1943. How, then, are we going to ration our available medical services so that no sick person shall go unattended? " He concludes: "I find no easy solution of this problem and believe it will try the energies and capacities of the older doctors to their utmost. Retired and semi-retired doctors, if able, will need to re-enter practice. Specialists, and those who limit their practice, must widen their services. Many general practitioners will need to limit their office hours to permit more house calls and older members of the profession will need to increase their hours of practice."

> ***"Perhaps lawyers, like doctors, should be forced to divulge information when the judge thinks disclosure essential to the public interest."***

Robert A. Cooke, MD, writes on the practitioner and the allergy problem, particularly respiratory allergy. At the onset, the author speculates that clinical allergy causing sufficient disability to require medical care occurs in from 7% to 10% of the general population. He also notes that during World War I, medical screening had rejected about 2.45 per 1,000 potential draftees because of asthma. Despite this, about 2 per 1,000 developed asthma while in service, and the rate of asthma amongst veterans now stands at 12 per 1,000. After describing many of the clinical manifestations of respiratory tract allergy, the author concludes with the following summary of his observations: "(1) Rarely is surgery (ie, sinus surgery) indicated under 25 years of age; (2) In patients allergic to inhalant and food substances, avoidance of or treatment with the allergen should always be practiced before and after surgical procedure; (3) The operation must be superlatively well done by one trained in surgical technique and with a thorough knowledge of the anatomy of the sinuses; (4) The object of sinus surgery is to remove infected tissue, leave the sinuses well open for drainage and conserve as much turbinal tissue as possible; (5) Resection of the septum is indicated only when there is interference to the surgical approach or a complete blocking of the nasal cavity; and (6) One trouble with sinus surgery is that when indicated it is done in piece-meal fashion."

Zechariah Chafee, Jr, Langwell Professor of Law, Harvard Law School, writes a scholarly paper entitled "Closing the Doctor's Mouth on the Witness Stand." Physicians and surgeons, he notes, are required by the ethics of their profession to preserve the secrets of their patients that have been communicated to them or learned from the inspection of symptoms and other bodily conditions. How far this ethical requirement should be enforced by law, he observes, is a question which there is much difference of opinion among both lawyers and doctors. No state, he continues, has made disclosure of confidence a crime, as it is in France, but in some the license to practice may be revoked for this cause. While acknowledging the importance of maintaining secrecy regarding confidences from patients, the author reflects: "Perhaps lawyers, like doctors, should be forced to divulge information when the judge thinks disclosure essential to the public interest." He quotes Jeremy Bentham. "Whence all this dread of the truth? Whence comes it that anyone loves darkness better than light, except it be that his deeds are evil?" Chafee explores numerous moral issues in the practice of medicine. He describes the obvious conflict between maintaining privacy on the one hand and disclosing information to a department of health on the existence of syphilis in a patient, on the other hand. He states, "If a doctor is required by law to report certain diseases to the Board of Health, and makes such a report honestly but mistakenly, he is not liable for slander. But should he be protected if he volunteers false statements to a private person?" He concludes: "The law would seem to have directed its attention to the wrong quarter in laying so much emphasis on silence in the court and neglecting until now the patient's rights against disclosures to the world in general."

> ***"The fear . . . that foreign-born physicians will replace the native-born practitioners in the private practice of medicine . . . is neither justified nor creditable . . . "***

The lead editorial asks, "Are you under 45?" The editorial then describes the current procedure for recruiting and commissioning qualified physicians, dentists and veterinarians in the state of Rhode Island. It concludes: "No one man's problems or group of men's problems can be greater than those of his country."

A second editorial discusses the large group of physicians who have recently entered this country as refugees from Europe. While "these men are debarred from entering private practice," the editorial states, "they may nevertheless be of great professional service within Rhode Island." They may serve in hospitals and other institutions, and they may be allowed limited practice privileges in remote communities where the need is great. The fear, expressed by many practitioners, is that these foreign-born physicians will replace the native-born practitioners in the private practice of medicine. The editorial says that such fear is neither justified nor creditable, "since the placement of such physicians is restricted."

The Committee on Education describes the 15-minute talks (on radio station WPRO) sponsored by the Medical Society. Topics include: Typhoid Fever; Infections of the Hand; Subacute Bacterial Endocarditis; Fracture Treatment; Surgery in Infancy; Arteriosclerosis; The Blue Cross Today; the Crippled Child; Sulfonamide Drugs; High Blood Pressure; and Nervous Indigestion.

A clinical pathological conference is presented by Drs KG Burton and BE Clarke. The patient was a child who had sustained a fracture of the left humerus three months before admission. Because of continuing pain and abnormal radiographic findings, a biopsy was performed. The final pathological diagnosis was osteogenic sarcoma.

Twenty Five Years Ago
(July, 1967)

The lead article is the address given by CL Hudson, MD, president of the American Medical Association, before the 156th Annual Scientific Assembly of the Rhode Island Medical Society on May 10, 1967. The paper is entitled "The Case of the Receipted Bill", and discusses the parallel interests of the government and the private physician in seeing to it that the patient discharges his financial obligation completely. He concludes: "We must not forget that the real threat to our system of medicine is not these minutiae, vexatious as they may be, but the threat of expanding the principle of social insurance." And, "Direct bill, receipted bill, itemized bill – all are important; but only if their significance to the two-man contract is not lost. A living, strong, fully understood and fully honored contract between patient and his physician is a solid barrier to socialized medicine."

A Kantrowitz, MD, discusses frontiers in heart surgery and the physiological basis for extrinsic support of the failing heart, particularly the newly devised mechanical heart, the auxiliary ventricle and the heart transplant.

F Jarrett, MD, provides an essay in medical history entitled "Rene Leriche, Surgeon of Pain, Physician of Anguish."

The lead editorial summarizes the findings of a fact-finding commission of American physicians who inspected the health resources of the USSR, noting both excellent and undesirable features of their hospitals. Other editorials discuss the future of the PhD degree; addiction in Rhode Island; and whether Rhode Island authorities should explore the merit of using a newly studied marine sponge as means of diminishing coliform bacteria in the waters of Narragansett Bay.

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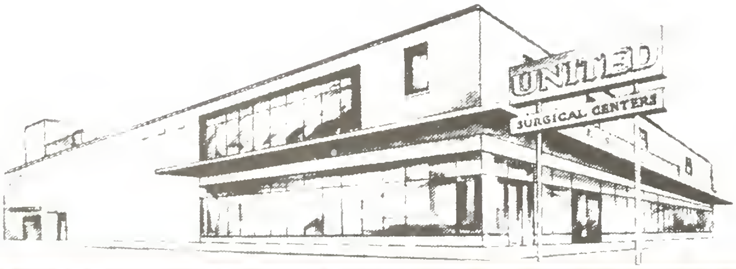

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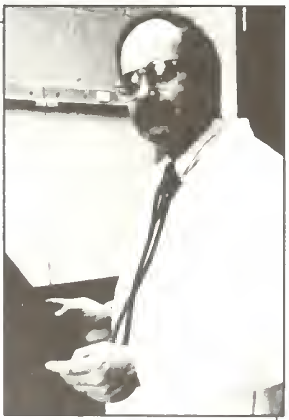

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August 1992

Volume 75, Number 8

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Ethnos and Ethos

What seemed simple a few years back turns out to be awesomely complex. The reconciliation of the patient's wants and the patient's needs, for example – the ideal goal of the ideal physician – sometimes becomes subverted by the intrusion of new ethnic agendas. A case in point is the deceptively simple clinical story explored in the pages of this month's *Rhode Island Medicine* by Professor Edward N. Beiser.

Reducing Beiser's case history to its most elemental features: A 17-year-old female, accompanied by her Cambodian mother, seeks help for persistent dysmenorrhea. The physician recommends an initial gynecological consultation (which will necessarily entail a pelvic examination) but is told by the mother, through a translator, that such action will damage her daughter physically and thus will diminish her chances of finding a suitable husband.

This case, after some reflection, is brief but hardly simple. Numerous questions arise: Are there no alternative diagnostic measures to a routine pelvic examination? (The routine, in Beiser's words, should never be confused with the necessary.) Have all channels of ethical persuasion been explored? Can reasonable assurances honestly be given to the patient and her mother that no physical damage will indeed result from such an examination? And, barring all else, can the patient be treated empirically without a prior pelvic examination and with no appreciable risk to her? Finally, has the physician attempted to place herself (or himself) in the alien world of this Cambodian mother, confronting and weighing her daughter's alternative risks: untreated dysmenorrhea on the one hand, and possible social disgrace within her small cultural enclave on the other?

The practice of medicine inevitably becomes less complicated when the physicians, the patients, the surrogates, the teachers and preachers – and all others in between – adhere to the same belief systems, buy the same hierarchy of values and taboos, and originate from the same ethnic sources. Homogeneity, in general, makes life easier – but it also makes life genetically impoverished and culturally dull.

Whether we welcome ethnic diversity or, alternatively, pine for the long-gone days of monoculturalism is essentially irrelevant: We live now in the reality of a southern New England increasingly peopled by waves of newcomers each carrying gifts – or burdens – of novel beliefs, fears and priorities. In the last two decades, for example, the human tapestry of Rhode Island has been enriched substantially by immigrants from Russia, Colombia, El Salvador, Haiti, Korea, and particularly from the nations of southeastern Asia, Vietnam, Laos and Cambodia.

It would be utterly naïve, then, to think that these new Rhode Islanders are already imbued with western scientific belief when they enter the Ocean State; or if not, that they will readily accept these strange new tenets of rational, western medicine while happily discarding their life-long folklore beliefs when passing through the US Customs Office.

Ethnologists have shown repeatedly that many Americans – native-born or immigrant – observe and employ health care regimes well outside the dominant western system with its visible hospitals, clinics and university-trained physicians. Western medicine, contrary to our wishes or expectations, has not supplanted the numerous folklore health measures; it merely has moved them underground. The two systems, one legally sanctioned and one practiced unobtrusively, coexist. DJ Hufford, a medical anthropologist, studied a large population of patients attending a university-based cancer clinic in central Pennsylvania. After achieving some rapport with them, he was able to elicit the following information: While actively attending the clinic for some form of verified cancer, 11.3% simultaneously sought treatment from those practicing herbal medicine; 73% used active prayer; 7% attended services conducted by charismatic faith healers; and 60% admitted to the use of some form of nonconventional folk remedy. Significant use of unconventional healing systems is not confined to the world of cancer patients. A Harris poll of patients with chronic arthritis disclosed that 26.6% of them employed unconventional therapies with or without the more orthodox interventions prescribed by their physicians. And, it would appear, rarely did they share this information with their allopathic practitioners. Information on unconventional therapies, like sexual preference or narcotics use, is not likely to be volunteered by the average patient.

The healing systems that run parallel to conventional allopathic medicine include those that are centered on herbals and/or diets; those that are more comprehensively naturopathic; faith healing and the laying on of hands, within or without organized religions; closely allied forms of spiritual medicine such as shamanism or Santeria; non-European folk medicine procedures; and the many secular home-remedies that have prevailed through years or even generations. For example, if all of the abundant family-centered cures for hangovers were ever assembled, a thick text book could be filled.

There is a vast, persuasive and vigorously rooted network of health beliefs and services in the United States that will neither wilt nor disappear when confronted with the tenets and accomplishments of modern medicine.

Do these unconventional systems cure – as we define "cure" in pathophysiological terms? Probably not. But these contemporary folklore health systems nevertheless continue to flourish without sustenance from either mainstream media or medicine, simply because they fulfill something demanded by their adherents. To one person, a cure is achieved when the fever abates, the muscle ache diminishes and the cough is abolished; to another person, a cure is accomplished when a feeling of inner harmony is reached despite the continuance of fever or aches or cough.

Beiser comments that a due respect for the cultural individuality of those seeking medical help will improve the outcome of our health care objectives. But due respect requires, first, some nonjudgmental understanding of the value systems professed by the patient, and only then a seeking out of those areas of potential conflict, or agreement, between the two systems.

This brings up an interesting, perhaps uncomfortable, question. How many of our patients, unbeknownst to us, are simultaneously seeking help from a faith healer? And if this patient's health does substantially improve, where then lies the credit for the cure?

Stanley M. Aronson, MD

The Language of Epidemiology (XIII.) Cause

A child pushes a ceramic vase off the table-top, and it then smashes on the dining room floor. After a few such shattering experiences the child discovers that there is a compellingly close association between (a) pushing an intact vase off the table, and (b) a broken vase on the floor. The child ultimately comes to believe therefore that undertaking (a) causes (b). (He may, in passing, also learn that (a) causes other things, some punitive.) To a more thoughtful and learned adult, however, the cause of the broken vase is substantially more complex. The adult might surmise, after some reflection, that the broken vase was caused by the conjunction of a number of contributory factors including a permissive domestic environment, the remorseless presence of gravity, the absence of a cushioning rug, and an initiating stimulus – the toppling of the vase. With closer scrutiny, causes of defined events can only be rarely ascribable to single causes. A search for simple causes, either in medicine or in politics, is customarily both fruitless and simplistic.

How do we define cause, and in particular, how do we employ the word in reference to disease? Consider three statements:

1. The acid-fast bacillus causes tuberculosis.

2. Excessive alcohol consumption causes hepatic cirrhosis.

3. Chronic gambling causes lung cancer.

A valid comment to each of these statements is, "Usually true, but not always." Each of these three statements is certainly based upon a strong statistical association between the putative cause and the defined effect; yet in each, the association is of a different character and meaning.

In the first statement, for example, we know of many instances where humans have been exposed to the acid-fast bacillus but no clinical disease has ensued. On the other hand, there are no verified instances of tuberculosis in the absence of the bacillus. The acid-fast bacillus, therefore, becomes a necessary but certainly not a sufficient cause of human tuberculosis. When, however, a person with a particular genetic, nutritional and life-style status is exposed to ample numbers of the acid-fast bacillus, clinical tuberculosis becomes virtually inevitable. Only in such a setting, does the acid-fast bacillus become a sufficient cause.

In the second statement, we know that there are numerous examples of chronic drinkers with intact livers; but, in contrast to the first statement, there are also many instances of hepatic cirrhosis in persons who have never consumed alcohol. Alcohol, then, is neither a necessary, nor by itself, a sufficient cause of cirrhosis; only when alcohol is conjoined with other metabolic and genetic factors does it become a sufficient cause.

The third statement is more difficult to accept; while its statistical truth is undeniable, it nevertheless seems biologically implausible. Perhaps we might accept a parallel statement attributing heart disease to gambling (ie, gambling = sedentary existence = increased cardiovascular risk) but no analogies come readily to mind between gambling and neoplastic disease – except if we search for those actions that often accompany, but are not not organically associated with, gambling. One such action is smoking. We can suggest then that gambling is not an etiologic agent for lung cancer but only seems so since it is is a surrogate for smoking. Existence of a defensible association necessarily precedes any early thoughts of causal interference; but association, even strong ones, do not necessarily guarantee causation: Placing a hospital patient's name on the critical list, for example, does not cause his death, although there certainly is a strong sequential association between the two events.

In clinical epidemiology, a number of standards for causal inference have accumulated. None of these criteria, alone or in conjunction with others, are absolute proofs of causation. When present, however, each strengthens the speculation that a true causal association exists.

1. **Time Relationship**: If the alleged cause always precedes the outcome, the likelihood of causality is increased. On the other hand, in the absence of a temporal relationship, the likelihood of causation diminishes to zero.

2. **Strength of Association.** If the incidence rate, following exposure to the alleged cause, is substantially greater than the incidence rate in those free of the exposure, then a causal relationship can be considered. If, in addition, there is a dose-relationship between cause and effect (eg, the greater the number of cigarettes smoked per day, the higher the ensuing rate of lung cancer), then the possibility is further strengthened.

3. **Consistency.** Does the putative cause seem to operate effectively in different geographic sites, different ethnic groups, different decades? Does excessive, chronic alcohol consumption, for example, cause cirrhosis in Tallahassee, Tiverton and Tel Aviv?

4. **Specificity.** Does long-standing pipe smoking increase the risk of lip cancer, while chronic pencil-chewing produces no such association?

5. **Biological Plausibility.** Does the tentatively considered cause and effect make sense in terms of prior clinical experience? Are there analogous situations in the realm of human disease? For example, when confronted with a new disease, such as AIDS, where shared intravenous needles seemed to be a major mechanism of transfer of the disease, can a virus be considered when seeking for an etiologic agent? Are there verified examples of other viral diseases (eg, hepatitis B) transmitted through contaminated needles or blood transfusions?

6. **Experimental models.** Can the suspected causal agent produce disease (or outcome) in an experimental animal that is similar to that observed in the human?

The word "cause," in medicine, must be used with great caution and accepted with much reservation. When the time interval between the assumed cause and the effect is quite brief (eg, a child touching a hot stove and the resulting burn, or a bullet discharged and the ensuing bullet-wound), there is little need for epistemologic debate. But when the latency interval is great, perhaps measured in decades, and numerous other risk factors inevitably intervene, it is rare indeed to find a solitary factor that is both necessary and sufficient to produce the outcome of interest. And yet we tacitly rely upon causality in the daily exercise of medicine. Without causality, every new clinical event is freshly minted and utterly unpredictable. As scientists, we must assume that life is full of recurring sequences and that identifying causes gives us some clue as to future events; our inferences for the most part will be imperfect – but this may reflect only the extent of our ignorance. Medical causality is best expressed in tempered, numeric terms – as the graded probabilities of the gambler rather than the inflexible pronouncements of the prophet.

Stanley M. Aronson, MD

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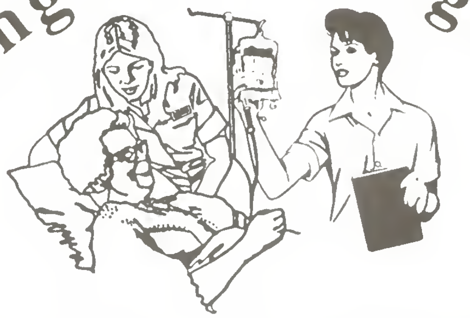

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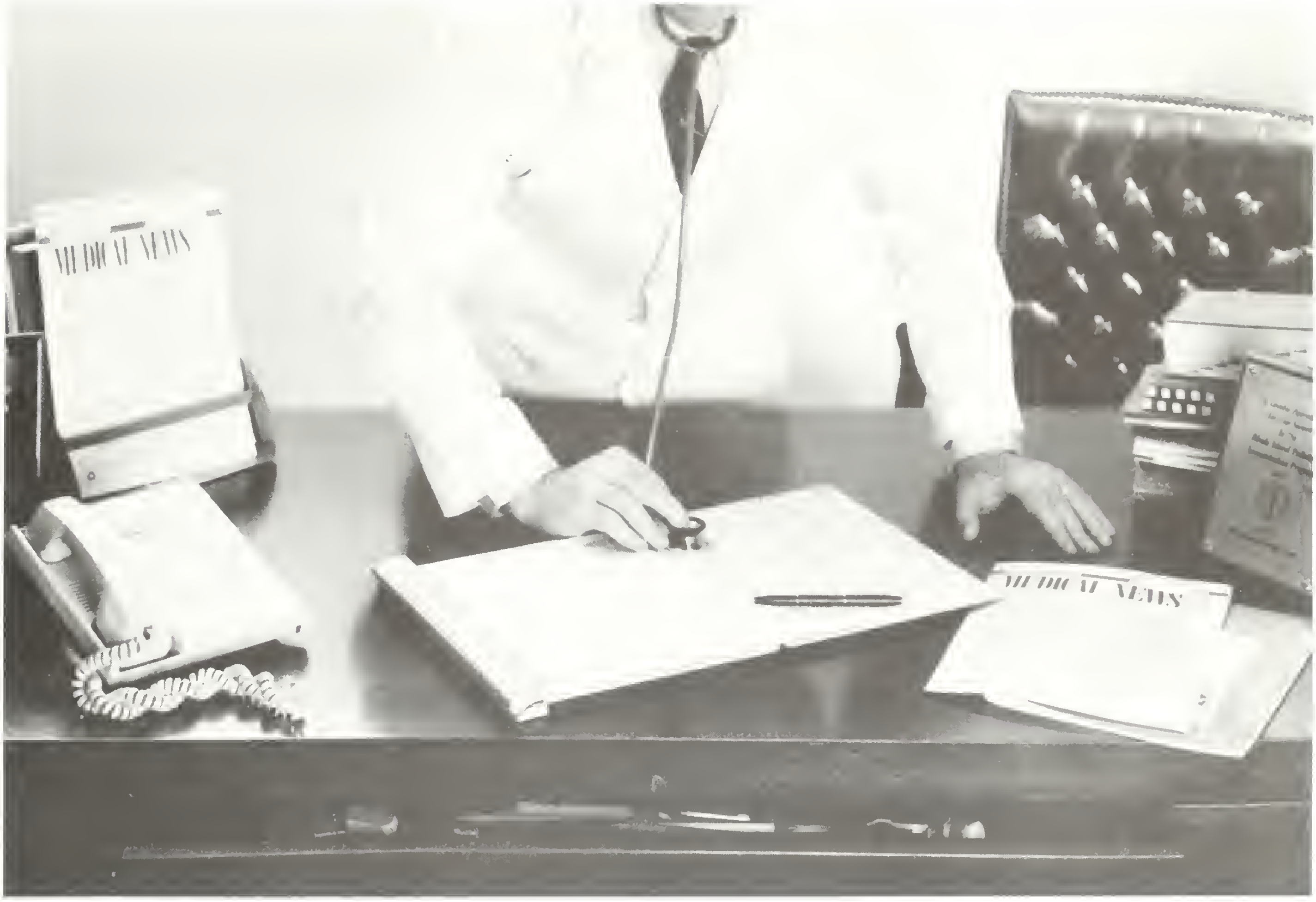

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The Physician in Aviation

Sidney I. Brody, MD, FACP

As the human body was introduced to flight and its unfamiliar, hostile atmospheric environment, the medical profession had to become familiar with its effects in order to develop preventive measures. In this way, the field of aerospace medicine had its origin.

After the United States became embroiled in World War II, Rhode Island enhanced its naval affiliations, then largely centered in Newport, by embracing naval aviation. The Naval Air Station at Quonset Point expanded rapidly to include an airport eventually capable of handling jet transports, an aircraft overhaul and repair facility with about 5,000 civilian employees, a port for aircraft carriers and a medical establishment that evolved into a separate command as a naval hospital.

At the former Charlestown Naval Auxiliary Air Station, training centered on the operational use of single engine aircraft with dive bombing and torpedo launching capabilities. President Bush, as a young naval aviator, received his advanced training there. Its rich history, in conjunction with access to early World War II aircraft, stimulated a group of enthusiasts recently to organize the Rhode Island Aviation Heritage Association which is committed to the restoration of these wartime aircraft and the construction of a museum to house them on the site of the old airfield at Charlestown.

Medical skills have always been an essential element to military operations. Physicians trained in aviation medicine were made available for the care of flying personnel at the Naval Hospital, Quonset Point. Their participation in this field represented the practical application of the study of medicine to the expanding role of aviation.

The Birth of a Specialty

From man's first flight in a tethered balloon little more than 200 years ago, the human body was introduced to an unfamiliar, hostile atmospheric environment capable of producing profound effects. As these flight-related changes became apparent, the medical profession had to become familiar with them in order to develop preventive measures. In this way, the field of aerospace medicine had its origin and eventually took its place among the approximately 100 established medical specialties.

The Pioneers

The achievement of flight by man and the popular interest it evoked encouraged John Jeffries, MD, of Boston to become the first physician involved in this new challenge. In 1784 in London, he made a balloon ascent only a year after the first successful balloon flight. His scientific background and curiosity prompted him to take air samples and make barometric pressure readings at different altitudes, originating a new area of research. A short time later, he and Jean Blanchard gained the distinction of being first to cross the English Channel by balloon – and to deliver international air mail.

But these noteworthy record-setting flights were the result of a keen interest in flying rather than in the investigation of potential medical implications. Consequently, Dr Jeffries is not regarded as one of the founders of aviation medicine but rather a contributor to the practical aspects of ballooning.

In the latter half of the 1800s, various scientific organizations began to sponsor flights primarily to collect environmental data. One in particular – which probably exceeded 30,000 feet – could have been disastrous since the pilot and passenger were unprepared for the adverse effects on their bodies that insidiously developed. James Glaisher, the passenger, ultimately lapsed into unconsciousness. The pilot, Henry Coxwell, experiencing a paralysis of his arms, had the presence of mind to grasp the valve rope in his teeth to initiate descent. This clearly demonstrated that functional changes in man occurred on exposure to the altitude potential of balloons and led to scientific investigations into the human factors incident to high altitude flight.

On the basis of his brilliant research in this area, the French physiologist, Paul Bert, is considered the father of aviation medicine. While breathing oxygen-enriched air, he took part in many experiments at simulated high altitudes using a low pressure chamber.

These flight simulations, however, could not provide data on all the envi-

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ronmental variables encountered at altitude. Consequently, Bert and his associates undertook actual flights, despite the inherent dangers, to gain more definitive scientific information.

In 1875, Gaston Tissandier, who had helped Bert as a subject in his studies, joined HT Sivel and JE Croce-Spinelli in a tragic high altitude flight in the balloon Zenith. Only Tissandier survived this ascent to almost 29,000 feet and his report remains a classic description of the effects of decreasing levels of oxygen in the rarefied air:

> "I now come to the fateful moments when we were overcome by the terrible action of reduced pressure. At 22,900 feet . . . torpor had seized me. I wrote nevertheless . . . although I have no clear recollection of writing. We are rising . . . at 24,600 feet the condition of torpor that overcomes one is extraordinary. Body and mind become feebler . . . There is no suffering. In the contrary one feels an inward joy. There is no thought of the dangerous position; one rises and is glad to be rising. I soon felt myself so weak that I could not even turn my head to look at my companions . . . I wished to call out that we were now at 26,000 feet, but my tongue was paralyzed. All at once I shut my eyes and fell down powerless and lost all further memory."

After reaching 28,820 feet, the balloon descended on its own with its two casualties. Paul Bert increased the scope of his research after this unfortunate episode and later completed an exhaustive monograph of more than a thousand pages on the physiological effects of barometric pressure.[1]

Physicians Take to the Air

It wasn't long before the lure of aviation continued to draw physicians to its many challenges in the same way Dr Jeffries was attracted to ballooning. The world's first pilot-physician, according to a recent article in *Aviation, Space and Environmental Medicine*, was Lt Luigi Falchi of the Italian Air Force, who served in Libya from 1911 to 1912.[2] This designation is questionable in view of a letter from Paris dated October 29, 1914 and published in the *Journal of the American Medical Association*. It reported the death of Dr Emile Reymond who became a pilot in 1910, possibly before Lt Falchi.

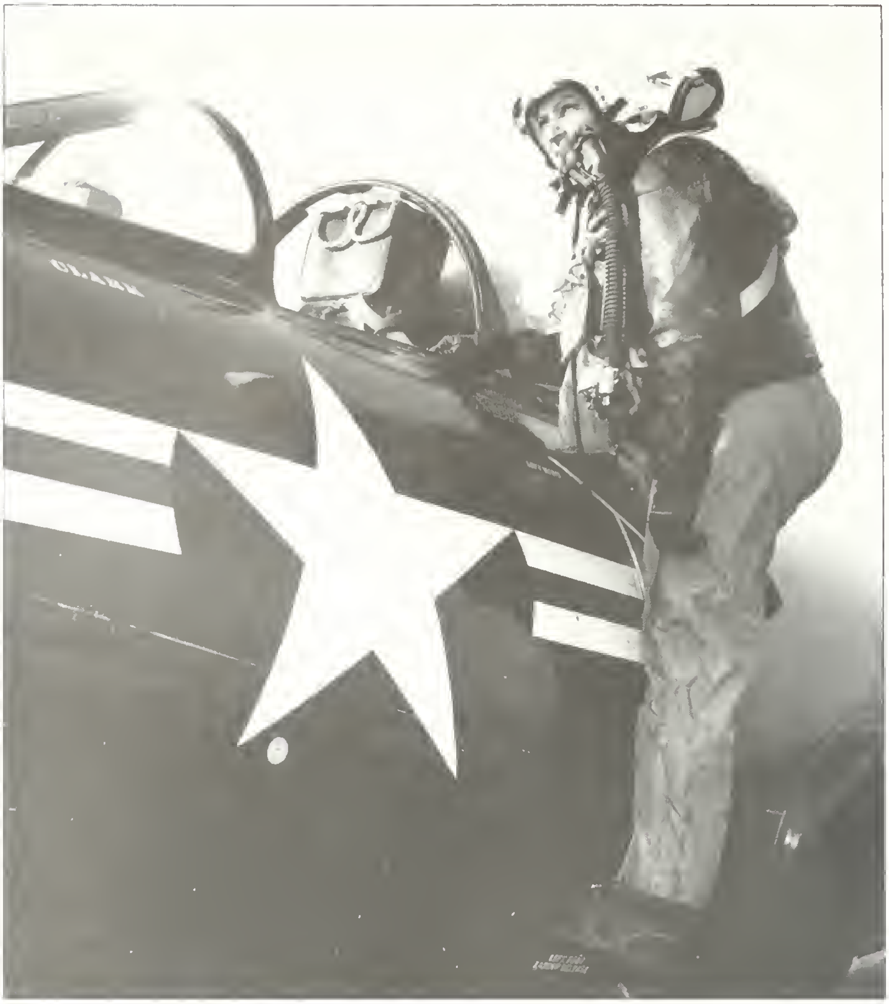
Fig. 1 – The author climbs into the cockpit of an early naval jet fighter, the F9F *Panther*, at the US Naval Air Station, Atlantic City, New Jersey in 1949.

Although a surgeon, Dr Reymond was vitally interested in the readiness of French military aviation, and he used the airplane to campaign for a seat in the French Senate where he pressed to have 600 aircraft in the army. At the outbreak of World War I, he was a major, first class, in the military health services and believed that the airplane might aid in the search for the wounded on the battlefield and also provide rapid transportation to the ambulances. Because of his flying experience he insisted on being transferred to the Corps of Aviators and was sent to the front where he was later wounded while reconnoitering over the German lines. After coming down between the combatant forces, he was rescued, and in spite of his wounds, he gave a complete report of his mission. In a scene reminiscent of an old movie, the commanding general awarded him the Cross of the Legion of Honor at his bedside before his death.[3]

In all probability, the few passengers carried aloft during the early risky years of flying were undergoing flight instruction. An unusual exception occurred, however, due to the urgency of a situation that arose on June 10, 1912 at Hammonsport, New York, when an airplane helped render vital medical assistance. The small son of the chief engineer of the Urgana Wine Company on Lake Keuka had accidentally fallen from a balcony into the vaults and was thought to be fatally injured. An urgent call was made to PL Alden on the other side of the lake who recognized the emergency and then contacted Hugh Robinson, an instructor at the Curtiss School, who took him over in a hydroaeroplane "as the distance by road was considerably greater than by air." The trip probably saved the boy's life since he suffered a compound fracture with extensive hemorrhage.[4]

The Influence of the Great War

World War I supplied an urgent stimulus to aircraft development. Efforts were made to introduce new capabilities in the use of this new weapon system in order to gain operational advantages. Countries embroiled in this conflict all strove to gain air supremacy and the exploits of military aces in the German, French and American Air Forces became legendary. By 1914, flying became more dependent upon human factors not only to improve safety but performance capabilities. As reports of adverse effects relating to accelerative forces or high altitudes became known, it was inevitable that military physicians associated with aviation would try to derive solutions for the many new aeromedical problems arising from the outburst of aeronautical progress.

Since the effects on the body resulting from decreasing atmospheric pressures were now well known, the capacity of reaching higher altitudes and the resultant military combat advantage made this consideration increasingly important. A note on the subject, "Oxygen Respiration at High Altitudes," stated, "The French seem very prejudiced in favor of oxygen and often start using it at only 10,000 feet," and it added that the altitude record had just been established at 20,295 feet.[5]

Many types of experiments were conducted on human subjects. German investigations were distinguished by their broad scope. A series of tests measured the attention and other psychological reactions of four subjects in a chamber with an atmospheric pressure corresponding to that of 4000 meters (13,116 feet). Although objective findings were few, the subjects were prone to make more mistakes in arithmetic as the air became more rarefied. Of significance were the subjects' feelings: the sensation of being incapable of giving close attention and of being unable to act promptly and with precision. Some were described as having more or less of a paralyzing effect and, according to the investigators, may explain certain fatalities directly attributable to aviators rather than their aircraft. It was the researchers' opinion that their test results were more meaningful than actual flight because the subjects were quiet, warm and free of responsibility in the low pressure chamber. Compare this with the condition of the aviator, the authors remark, exposed to rapid change in altitude causing physical disturbances and "weakening the will power while the wind makes it hard to breathe and chills the surface, and finally paralyzes the peripheral vessels so that the blood pours into them and the brain, etc., become anemic." They also suggest that the death of an aviator who tried to break the altitude record was also due to these causes. A result of their research was to warn aviators against high altitudes and urge them to train themselves to bear abrupt changes in atmospheric pressure.[6]

. . . the term Flight Surgeon was coined in early 1918, and subsequently physicians trained in military aviation medicine were officially so designated.

The extrapolation of the low pressure chamber results obtained by these German investigators evoked a response from a noted aviator, Earle L. Ovington, who had read a report of these findings in the *Journal of the American Medical Association*. In a letter addressed to the editor, he wrote that he had read with some interest the article on altitude effects and commented, "I do not know how much this subject interests the medical profession, but I cannot allow a notice like this to pass without giving my views as a practical aviator." Ovington emphasized his belief in high altitude flying, pointing out that he had won a tri-state race flying at a similar altitude of 2-1/2 miles and he doubted whether the subjects of the German experiments had ever been in actual flight. He found the physiological effects depressing and in contrast to the experiments, the psychologic sensations were exhilarating. As to problems in breathing, he stated that he had none even at speeds as high as 150 mph, "with the wind, of course." It was his opinion that a mountain climber because of the exercise involved would be aware of the rarefied air before the aviator who is strapped to his seat.[7]

Just as standards were established for entrance into military services, it was considered necessary to regard the fledgling air forces as having special physical requirements for flying personnel, although it was unclear in the beginning as to what they should be. Nevertheless, in the latter part of 1914, physical standards were set for pilot candidates applying to the US Army. Emphasis was on strict vision requirements, and there were tests to measure equilibrium and resistance to vertigo. Unfortunately, all the standards were set so high that after 6 weeks all candidates were rejected.[8]

Efforts in this direction persisted, however, and various measurements of physical criteria evolved, although their correlation with flying capabilities were often inconclusive. Indeed, some of these standards were used by medical officers for years as routine elements of the flight physical examination only to be eliminated when they were found to have a questionable association with flight performance. The Barany Test for equilibrium, for example, was removed from the flight candidate examination early in World War II after having been one of the more unpleasant tests experienced by aspiring aviators since the first World War. The Schneider Index test for heart and blood vessel efficiency was so much a part of the annual flight physical examination that it wasn't dropped until early in the 1950s despite the increasing awareness of its doubtful correlation with physical requirements.

Flight Safety Origins

In these formative years of aviation an important aeromedical concern now known as human engineering developed, relating to personal equipment, seat configuration, instrument and control placement and their design. As wartime requirements demanded an emphasis on aircraft production, standardization in this area became necessary in order to integrate a wide variety of human performance elements in the cockpit environment. Limits of body size, height and weight were established, but it was much more difficult to test and assess functional capabilities. The Army had concluded that flying accidents during peacetime were preponderantly related to pilot factors, with 70% of them due to physical conditions alone. About 20% were attributed to carelessness, overconfidence and recklessness and 5% were ascribed to ignorance or lack of training. Thus, of all aircraft accidents, only 5% were related to material failure or weather conditions.[9]

In general, these findings were later substantiated by wartime experience. At the end of the first year of World War I, the British determined that only 2 out of 100 flight fatalities were the result of enemy action, while 8 resulted from material failure. Of the remaining 90 individual deficiencies, physical unfitness, recklessness and carelessness were major causative elements, and 60 of these were found related to some type of physical defect. These findings prompted efforts to improve flight safety and changes were made in flight physical examinations and testing with significant results. Fatalities in the second year of the war due to physical unfitness dropped from 60% to 20%, and in the following year to 12%.[8]

By 1918, all flying personnel in United States military services were tested for reaction to reduced levels of oxygen at a simulated altitude of 10,000 feet in a low pressure chamber. In March of that year, Captain Schneider, developer of the Schneider index, and an assistant significantly advanced physiological research by reaching 34,000 feet in 24 minutes in a chamber experiment.

As the role of aviation medicine became more intertwined with the operational use of aircraft in the military, medical officers trained in this subject developed a close relationship with aviators in their units. This rapport gave them an unusual understanding of the personality and character of each aviator. Also, with this association, they better appreciated the physical and emotional stress encountered in military flying. To reflect this special role, the term "Flight Surgeon" was coined in early 1918, and subsequently physicians trained in military aviation medicine were officially so designated.

"The noise and rush of air, together with a subconscious sense of fear that causes one to shrink involuntarily from looking over and down are more or less overshadowed and pushed into one's mental background by the wonderful maplike appearance of a previously commonplace earth."

The Physician Aviator

In order to gain maximum knowledge regarding aeromedical applications and problems related to flying the army, air force and navy assigns flight surgeons occasionally to the same flight training given operational aviators. The first medical officer to be ordered to flying duties was Major Ralph N. Greene of the Florida National Guard in 1916. In 1917, he published an article that most graphically describes his flying experiences.[10]

He indicated that flights were made under a great variety of weather conditions including low temperatures and extremely high winds at altitudes between 9,000 and 11,000 feet, "and included, by intent and by accident, most of the so-called aerial spectaculars, including flying upside down.

"One is suddenly thrust from the quietude and security of an earthly abode into a new and wonderful environment. The noise and rush of air, together with a subconscious sense of fear, which causes one to involuntarily shrink from looking over and down, are more or less overshadowed and pushed into one 's mental background by the wonderful map-like appearance of a previously commonplace earth."

The account then revealed details that emphasize how intrepid the early fliers really were. "If you will, for the sake of comparison, picture yourself standing on a platform of evident frailty and insecurity, at the edge of a great roaring waterfall, hearing its noise and seeing its movement and feeling its magnetism, the subtle drawing and beckoning of a power so hard to resist . . . and know that . . . you are in immediate danger of a horrible and sudden death, instinctively, under such conditions, you would shrink towards a point of safety and life, yet in all probability the very novelty and attractiveness of the situation would bid you linger longer; if you can fully imagine all of this, you will have a slight understanding of what flying in an aeroplane really means.

"With an uncomfortably tight-fitting helmet, leather coat and goggles adorning my person, I lacked miserably that sense of bravado that seems to go with aviators. Carefully I climbed through a maze of taut cables, fearing that in my suppressed discontentment I might shove a Munson army shoe through the fabric covering of a wing section. The seat looked microscopically small and, being constructed of aluminium, I realized for the first time how lacking the material must be in tensile strength." He regarded the safety belt "not as a safety factor, but as an official seal of inevitable disaster."

Major Greene mentioned two other relatively common effects of aeromedical importance after he experienced them for the first time: a sensation of ear drum pressure and vertigo. Since flying is now such a familiar mode of travel, most people today anticipate difficulty in restoring the air pressure within the middle ear on descent and easily correct it before landing. However, the recognition of this problem and how to deal with it was most enlightening at a time when aircraft performance was beginning to produce a variety of significant effects on the body. Major Greene suggested, "Opening the mouth and swallowing frequently while coming down will equalize the air pressure in the Eustachian tubes and enable one to avoid this unpleasant pain and transitory deafness," advice that is still beneficial.

> *"With an uncomfortably tight-fitting helmet, leather coat and goggles adorning my person, I lacked miserably that sense of bravado that seems to go with aviators."*

The disagreeable symptoms of vertigo or disorientation is experienced by virtually every flight trainee, and indeed should be, so that its onset can be recognized immediately. Although he did not suffer true vertigo, Major Greene observed, "In coming down through a dense bank of cloud there is no perspective or sense of direction." After diving into a thick bank and perceiving a gradual increase in pressure on his safety belt, he was surprised to be informed by the pilot that they had been flying upside down.

The passage of time has provided ample evidence that the union of medicine and aviation has been a natural evolution. Throughout this association flight surgeons always have been aware of the close emotional attachment pilots develop towards their aircraft. This bond probably was enhanced during the early days of aviation by constant reminders of the risks involved and a more direct personal exposure to the influence of the elements.

A measure of this feeling may remain with those who went through flight training at the beginning of World War II when the "Yellow Peril," the Stearman N2S or Navy N3N fabric-covered biplane was the mainstay of primary flight training. Those who were at the controls during aerobatic maneuvers in the open cockpit will recall fondly its being the only time they felt that they had wings strapped to their body – a kind of kinship with Icarus and Daedalus – sensations lacking in aircraft with more advanced flight performance.

Physical and emotional stresses on military aviators often tend to increase with changing operational requirements. However, aeromedical specialists now can assure aircraft designers that the aviator will be equal to any required task. This is largely due to technologically advanced equipment they use in investigating performance, from the human centrifuge to space simulators.

This level of confidence could not have been achieved without the contributions of the early aviation and aeromedical pioneers. Aerospace progress is certainly dependent upon solutions to the innumerable problems which they encountered.

To those who flew the "Yellow Peril," science fiction has become a reality.

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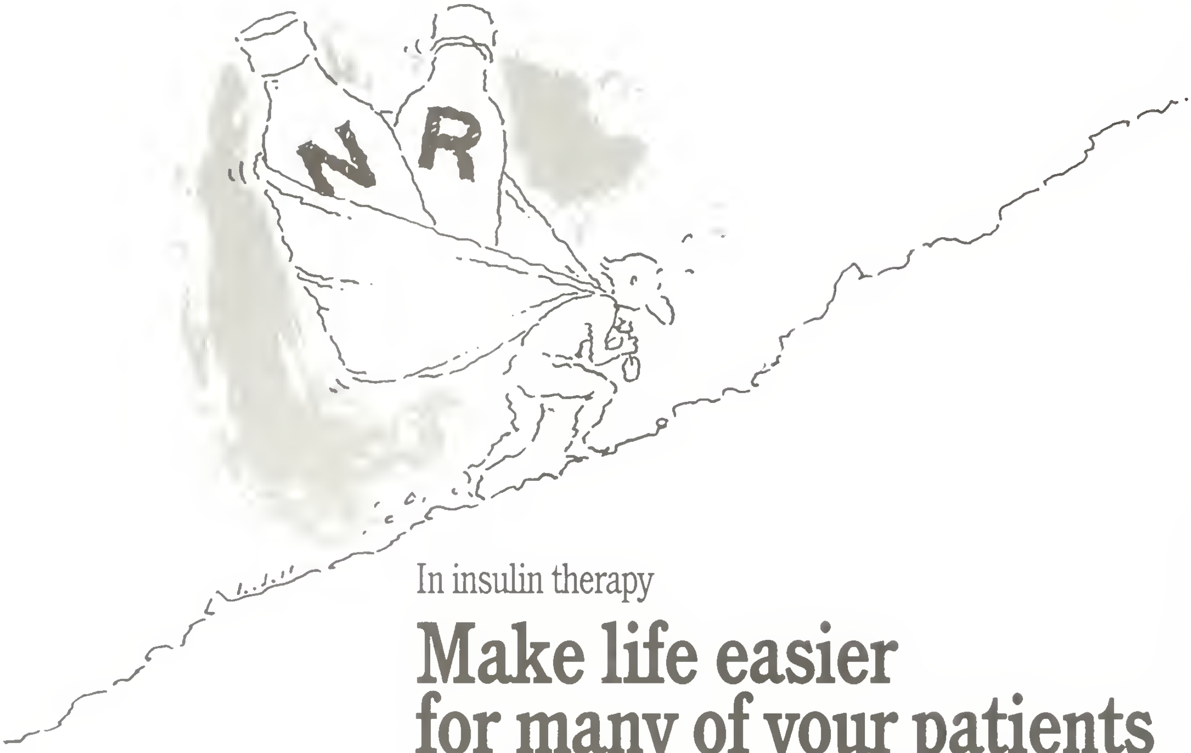

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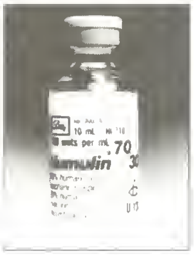

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Motor Vehicle Fatalities in Rhode Island (FY1990-1991): A Report on Driver Impairment

Nancy R. Haley, MS, MT (ASCP)
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Autopsy specimens from 52 fatally injured drivers in Rhode Island were analyzed for the presence of alcohol and other drugs of abuse, including, among others, cocaine, opiates, cannabinoids (THC), and phencyclidine (PCP). The ages of the drivers ranged from 16 to 87 years; 41 were male and 11 female. Based on this sample, 65% of Rhode Island driver fatalities involve drugs. The most common drug, alcohol was found in 59% of the cases. Drugs other than alcohol were detected in 19% of the cases, 13% had illicit drugs found in combination with alcohol, and 6% had illicit drugs only.

The influence of alcohol consumption on motor vehicle driver behavior is well established.[1-3] The growth of drug abuse in this country is reflected in drug abuse by motor vehicle drivers.[4-7] The effects of these drugs alone, in combination, or with alcohol on driver behavior, are not fully understood.

There is a state and national public health need for information regarding the extent to which operators of motor vehicles are impaired by drugs, which drugs are being used, in what combinations, and at what levels. According to statistics from the National Highway Traffic Safety Administration, each year almost 45,000 Americans are killed in motor vehicle accidents, and 50% of these motor vehicle accidents are alcohol-related.[8] In Rhode Island, from July 1990 to June 1991, the blood of 59% of the 52 driver fatalities contained alcohol (ie, ethanol).

Nancy R. Haley is supervisor, Paul S. Iwuc is principal forensic scientist, Laurie M. Ogilvie is senior forensic scientist, and Lori R. Carria is toxicologist, all with the Forensic Toxicology Laboratory, RI Department of Health, Providence, Rhode Island.

Laboratory Data

The Rhode Island Department of Health's Forensic Toxicology Laboratory received a federal grant to establish a database and to monitor the use of drugs by Rhode Island drivers. The laboratory provides drug and poison analysis in medico-legal autopsy cases for the Office of the Medical Examiner, and also provides drug and alcohol analysis in Driving Under the Influence (DUI) cases for all Rhode Island law enforcement agencies. This laboratory, therefore, is uniquely situated to perform drug analyses and assemble a statewide database of drug and alcohol use in both fatal and nonfatal motor vehicle accidents and Driving Under the Influence of Drugs (DUID) arrests.

A database was established in July 1990 to record all medical examiner driver fatalities and law enforcement DUID cases. A total of 170 cases were recorded for the fiscal year (July 1, 1990 to June 30, 1991) representing 118 law enforcement driving cases and 52 medical examiner cases of fatally injured drivers. The data from the medical examiner cases were analyzed further to identify a pattern of drug use among drivers in Rhode Island.

There were 52 fatally injured drivers in Rhode Island in the past fiscal year representing 10.5% of all the deaths in Rhode Island investigated by the Office of the Medical Examiner.[9]

Of these, 14 (27%) were motorcyclists and 38 (73%) were automobile drivers (Figure 1). Twenty-four of the 52 cases (59%) were positive for alcohol. In 10 cases (19%), drugs other than alcohol were found (Figure 2). The positive findings include the following classes of drugs: stimulants, such as cocaine and its metabolites; narcotic analgesics, such as morphine and codeine; non-narcotic analgesics, such as propoxyphene; sedatives, such as barbiturates and benzodiazepines; and hallucinogenics, such as cannabinoids (THC) and phencyclidine (PCP) (Figure 3). Of these cases, 13% had drugs found in combination with alcohol and 6% were positive for drugs other than alcohol. The age of the fatally injured drivers ranged from 16 to 87 years of age. A significant differ-

ABBREVIATIONS USED:

BAC: Blood alcohol content
DUID: Driving under influence of drugs
NHTSA: National Highway Traffic Safety Administration
PCP: phencyclidine
THC: cannabinoids (eg, marijuana)

Fig. 1–RI Motor Vehicle Driver Fatalities–Automobiles vs Motorcycles (Data from 1990-1991)

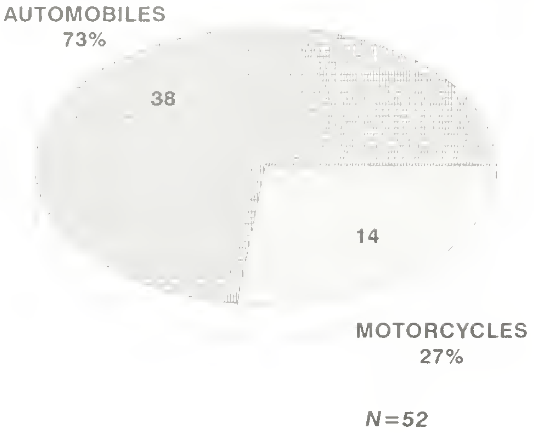


Fig. 2–Alcohol and Drug Related Findings in RI Motor Vehicle Driver Fatalities (Data from 1990-1991)

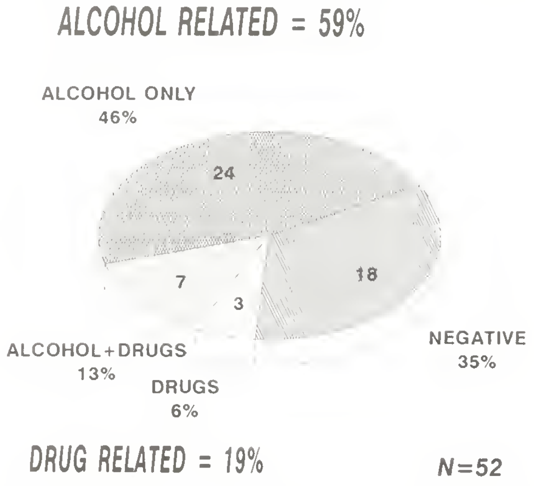


Fig. 3– Drugs Found in "10 Drug-Related" Motor Vehicle Driver Fatalities (Data from 1990-1991)

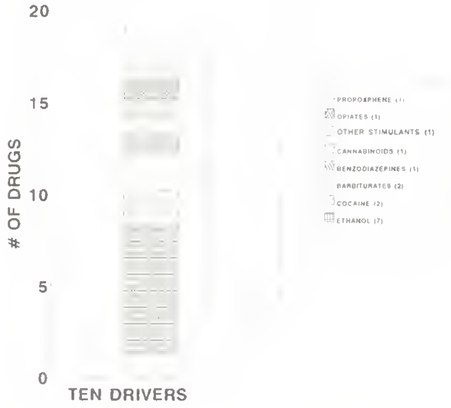
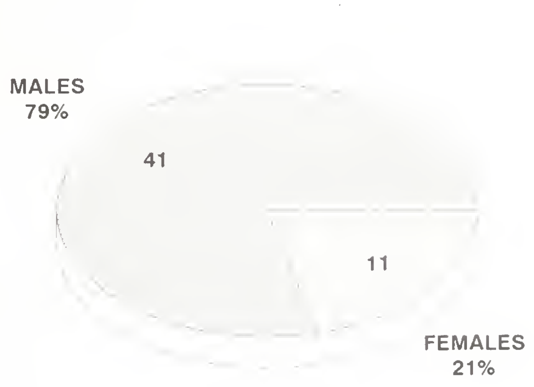


Fig. 4 – **Number of Male Driver Fatalities vs Number of Female Driver Fatalities (Data from 1990-1991)**



ence in the number of cases involving male (n=41) and female (n=11) drivers was found (Figure 4).

Safety and Drug Use

The US Centers for Disease Control reported in July 1991 that a study of motorists involved in fatal crashes showed that non-drinking drivers were more than twice as likely as drinking drivers to be wearing seatbelts. In this Rhode Island study, the auto driver fatalities were divided into three categories: seatbelt, no-seatbelt, and undetermined. Of the two drivers who were wearing seatbelts, one had a blood alcohol concentration (BAC). Since there were only two drivers in this category, this number does not permit any significant conclusions. The no-seatbelt category accounted for 26 cases or 68% of the total number of drivers who died in an auto accident. Of these, 23 had alcohol only, 5 had alcohol present in combination with other drugs, 2 had drugs other than alcohol, and 6 had no alcohol or any other drugs detected. Therefore, for drivers not wearing seatbelts, 77% of them had drugs present in their blood, while 23% were drug-free. It is also evident from our data that the majority (68%) of auto driver fatalities in Rhode Island were not wearing seatbelts at the time of their death.

Of the 14 deaths involving motorcyclists, 7 (50%) wore a helmet, 6 (43%) did not and in one case it was not determined whether a helmet was worn. Of those wearing helmets, 2 (29%) had significant blood levels of alcohol and/or drugs, while all of those without helmets had significant alcohol and/or drugs present. These findings do suggest that a correlation may exist between substance use and the failure to make use of safety devices such as seatbelts and helmets.

Conclusion

Alcohol remains the leading substance of abuse in Rhode Island DUID cases. A blood alcohol concentration was found in 31 of the 52 driver fatalities, and in 23 of these the level was greater than the legal level determining intoxication (Figure 5). The fact that other drugs were detected in 10 cases suggests that all cases should be analyzed for drugs as well as alcohol and that blood levels be determined. This data may prove to be significant in assessing impairment while operating a motor vehicle under the influence of drugs other than alcohol.

The presence of drugs other than alcohol in the blood stream does not prove causality in motor vehicle fatalities or determine impairment in the drivers. There needs to be a wealth of additional data available before the role of substance use in fatal motor vehicle accidents can be assessed accurately. At present, only alcohol has an abundance of direct epidemiological evidence to support that its use by drivers is detrimental to the safe operation of motor vehicles.

The National Highway Traffic Safety Administration (NHTSA) has been working for several years to improve the ability of traffic law enforcement agencies to apprehend and convict persons operating motor vehicles while under the influence of drugs other than alcohol.[10] They have developed a drug evaluation and classification program to examine a person suspected of driving impairment and to categorize the drug or drugs that are likely to be the cause of the impairment. This program arose from the need to have a means whereby drivers could be prosecuted who were driving while impaired by drugs other than alcohol. In the Rhode Island study, 19% of the motor vehicle driver fatalities had drugs other than alcohol present at the time of death.

It must be recognized that the presence of drugs other than alcohol in the bloodstream does not prove causality in motor fatalities or determine impairment in the drivers.

This is the first report on the laboratory 's data for the 1991-1992 fiscal year; future statistics should allow for more pertinent forensic conclusions. If the laboratory continues to receive support and encouragement, the study will be continued for several years, which should allow for significant conclusions on Rhode Island motor vehicle fatalities. A continuation of this study also will provide statistical data that may reveal a possible trend in substance abuse in this state. Armed with this data, meaningful DUID legislation can be prepared and cost-effective law enforcement, laboratory, and education programs can be designed.

Acknowledgments

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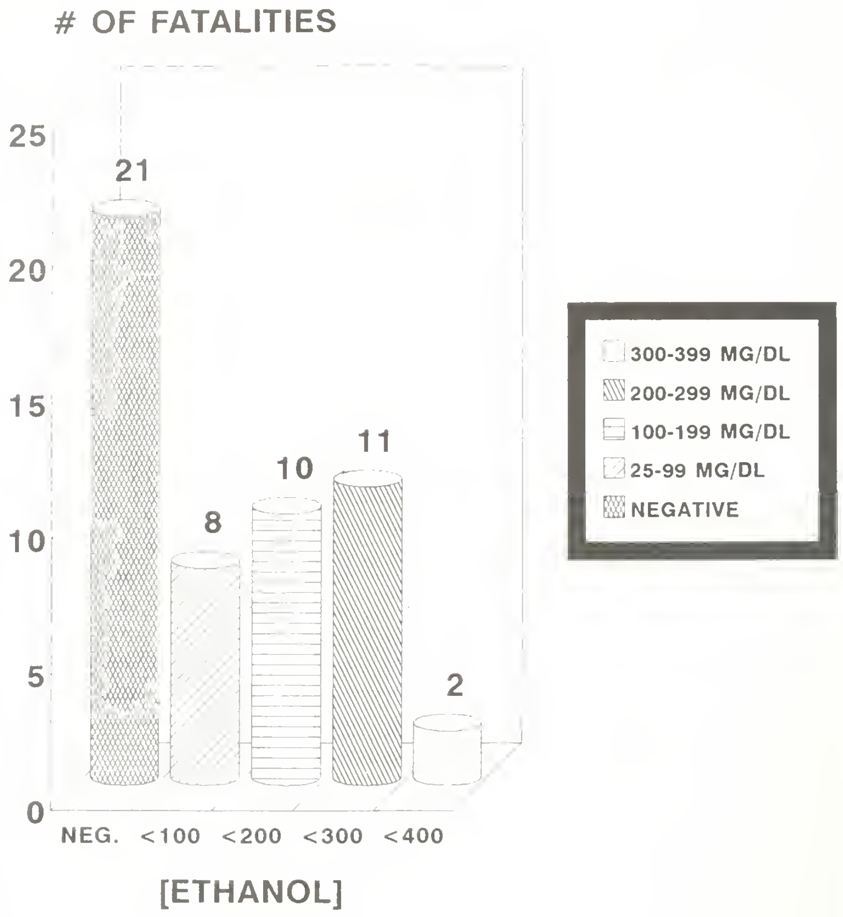
Fig. 5 – **Blood Alcohol Concentrations Found in RI Motor Vehicle Driver Fatalities (Data from 1990-1991)**



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Affordability Considerations in Certificate-of-Need Hospital Capital Expenditure Review Determinations

John X. Donahue, MPA
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Beginning in 1984, public affordability became a central standard along with public need in the review of hospital proposals for capital development in Rhode Island's certificate-of-need (CON) program.

Introduction

In 1968, Rhode Island became the second state in the nation to establish a certificate-of-need (CON) program. Throughout the 1970s, Rhode Island maintained a well-run program with the Health Services Council advising the director of health on CON decisions. Like all CON programs, the main focus of the Rhode Island CON program was public need. An applicant for hospital, nursing home or other capital developments had to demonstrate public need in order to get an approval from the director of health.

In the beginning of the 1980s, several observers in Rhode Island government, business and health insurance perceived the CON process to be deficient because it did not take into account public affordability. These observers believed that a capital allocation process that had no overall financial constraints was inherently unrealistic, since the basic tenet of economics is that needs and wants are unlimited while resources are limited. They observed that budgeting is an essential part of effective management in all aspects of public, private and personal business.

In 1982, Reps. Anthony Carcieri and William Durand introduced legislation into the Rhode Island General Assembly "Creating a Special Legislative Commission to Study Health Care Capital Expenditures." This special legislative commission met from July to December 1982. The commission's final report was approved on January 25, 1983.

The commission made 16 recommendations including the following key proposals:

> "The parties to the Prospective Reimbursement Process shall provide the Health Services Council with the maximum increase in costs associated with CON-approved proposals, which can be afforded.
>
> "The Health Services Council (HSC) may approve projects for implementation by order of relative priority up to but not exceeding the limit specified by the Prospective Reimbursement Process, but the Health Services Council need not exhaust the limit."

In 1984, the Rhode Island General Assembly enacted the recommendations of the Special Legislative Commission. The passage of the Health Care System Affordability Act, which was introduced by Rep Carcieri, made a pivotal change in the Rhode Island CON program. Public affordability became a central standard along with public need in the review of hospital capital development proposals in Rhode Island.

Description

Legally, CONCAP, the acronym used to identify the program, means "... the annual dollar limit on interest and depreciation expenses associated with all capital projects subject to certificate-of-need review proposed by or on behalf of health care facilities who by contractual agreement, chapter 27-19, or other statute are required to adhere to an annual schedule of budget or reimbursement determination to which the state is a party." Operationally, CONCAP is an annual statewide capital limitation or "cap" placed on all CON reviewable acute care hospital capital expenditures. In essence, it is a form of statewide capital budgeting applicable to hospitals for the purpose of establishing an annual affordability limit on hospital capital expenditures. Hospital proposals must compete for funding within this annual system-wide affordability limit. CONCAP is mandated by law and cannot be exceeded in granting CON approvals for hospitals' capital proposals.

The annual limit or CONCAP is a negotiated amount determined independently by the state's prospective

ABBREVIATIONS USED:

CON: Certificate of Need
CONCAP: Financial cap with CON projects
DRG: Diagnosis-related groups
HSC: Health Services Council
PR: Prospective reimbursement

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reimbursement (PR) program. In Rhode Island, PR represents an annual negotiation of community hospitals' aggregate operating expenses conducted between the hospitals and two key payors, Blue Cross and Medicaid. Once negotiated as part of PR, the CONCAP becomes the maximum annual dollar limit on the amount of hospital proposed capital funds that can be found to be affordable to the people of Rhode Island.

The CON regulations require that all community hospital CON applications be submitted at the beginning of each calendar year. Immediately thereafter, the state agency makes an initial determination whether the full application of CONCAP requirements, including negotiations and priority setting, will apply for that annual hospital review cycle. If the aggregate amount of all of the individual hospital capital projects (first full year depreciation and interest) is less than a statutorily predetermined amount (ie, the minimum CONCAP), then the need for negotiations and priority-setting is obviated. If the sum of all of the individual hospital capital requests (first full-year depreciation and interest) is greater than the minimum CONCAP ($3.9 million for 1992) then formal CONCAP negotiations and the priority setting process will apply. Given the nature of capital expenditures, this initial determination has been established to provide flexibility in years when the magnitude of funding requests is not sufficient to warrant intense budgeting for hospital capital funding.

After this initial determination, all interested parties are notified when the hospital cycle review begins (February 10). The Health Services Council (HSC) reviews individual hospital proposals. Each proposal is subject to the standard CON review procedures and criteria applicable to all CON projects with two exceptions. First, the payors of the PR program (Blue Cross and Medicaid) are required to provide cost impact analysis on each individual hospital capital proposal. Each cost impact statement must include consideration of the individual proposal's effects on increases in operating expenses, per diem rates, health care insurance premiums and public health expenditures. Second, hospital projects must follow a two-phased recommendation process. Initial council recommendation on individual hospital projects pertain to matters of "public need" with the second HSC required recommendation on "affordability" being reserved until completion of the priority-setting process.

The Health Services Council first considers the merits of each proposal based on the more traditional need considerations and takes formal action recommending approval or denial on the "public need" for individual proposals.

Simultaneous with CONCAP review commencement, the parties to PR (Hospital Association, Blue Cross and Medicaid) negotiate the annual CONCAP amount for the hospital cycle. Once negotiated, the CONCAP is forwarded to the HSC. The HSC first considers the merits of each proposal based on the more traditional need considerations and recommends approval or denial on the "public need" for individual proposals. Proposals recommended for denial on need are disposed of at this phase.

For all of the proposals deemed to be needed, the HSC then requires each of its 22 members to rank each proposal based on eight specific factors (Table 1). The aggregate ranking of projects is then based on the mean rank of individual HSC-member rankings. With priorities ranked, the HSC then formally acts on the affordability of each proposal beginning with the highest ranked project. When the council recommends approval of the highest ranked project, that project's interest and depreciation expense "draws" against the negotiated CONCAP. The HSC continues to consider and act on each of the remaining projects according to rank until there are insufficient CONCAP funds remaining or the council votes to not expend the full CONCAP. Any remaining proposals must be denied as not affordable to the people of the state. All of these recommendations are subsequently transmitted to the director of health for final determination.

The process allows the HSC to consider the relative "need" and "affordability" of each hospital project submitted within the context of an overall budgetary limitation of capital. Again, the necessity for such a limitation of hospital capital spending has been recognized in Rhode Island because of the reality that perceived needs tend to strip available resources.

Analysis of CONCAP

As a means of assessing the effect of CONCAP on hospital capital expenditure proposals, a pre- (1979-84) and post- (1985-90) CONCAP analysis of hospital CON reviews was undertaken. During this study period, 100 major hospital capital expenditure proposals were submitted for certificate-of-need review in Rhode Island. Of this total, 56 proposals were reviewed during the pre-CONCAP period and 44 under CONCAP. In terms of final outcome, 84% of all pre-CONCAP proposals were approved in comparison to 70% of all proposals subject to CONCAP.

Table 1. – **Factors for Priority Setting**

1. Population Need
2. System Planning
3. Cost Effective Alternatives
4. Compatibility with Health Care Systems
5. Quality
6. Special Needs
7. Finance
8. Affordability

Recognizing the limited value of using gross approval rates for the different time periods as a meaningful measure of program effectiveness, the analysis included a comparison of the percentage of capital dollars approved for pre- and post-CONCAP periods. In the pre-CONCAP years 81% of the total capital dollars requested were approved as compared to an overall 60% approval rate for the years following CONCAP implementation. Therefore, it appears that CONCAP with this mandated criteria for determining public affordability has been a factor in lowering the overall rate of approved capital expenditures in Rhode Island.

Another factor that is often discussed but difficult to measure in any analysis of certificate-of-need is the extent to which regulatory review prevents marginal CON proposals from being submitted at all. While it is not possible to document proposals not submitted for review because of CONCAP, it can be conjectured that given the competitive nature of applicant hospitals vying for limited capital funds, marginal projects have not been submitted for review.

To measure the impact of the affordability requirement on proposals submitted during the CONCAP period, the analysis reviewed the total amount of proposed CONCAP dollars (interest and depreciation) initially put forth by hospitals versus the aggregate amount of approvable CONCAP dollars for the 6-year period. Altogether, the 44 hospital applications initially proposed first-year aggregate depreciation and interest expenses of $35 million dollars and the aggregate amount of approvable CONCAP dollars was $20 million.

Further analysis of the 31 proposals that were approved within the $20 million dollar CONCAP provides insight as to fiscal impact of CONCAP on proposed capital related expenses. Those 31 proposals initially included CONCAP draws amounting to approximately $28 million with $13 million prosed for depreciation expense and $15 million in first year interest expense. As a result of project modification including downsizing of construction projects and increasing equity contributions to financing plans, the $28 million of "needed" projects were scaled back to $20 million. This was accomplished through a $2 million savings in overall annual depreciation expense ($13 million to $11 million) and a sizable reduction in aggregate annual interest expense of $6 million ($15 million to $9 million). Thus, the total aggregate annual saving that can be attributed to CONCAP for "needed" projects is $8 million.

The biggest impact of CONCAP, therefore, has been on the reduction in interest expense due primarily to the existence of this negotiated budgetary constraint. These interest savings for "needed" projects has been the result of greater institutional equity participation thus lowering the cost to the community for borrowed funds.

> ***. . . CONCAP with its mandated criteria for determining public affordability has been a factor in lowering the overall rate of approved capital expenditures in Rhode Island.***

Another way to measure this impact on interest expense is to consider the HSC's traditional policy for equity financing of capital projects, which is 20%for bricks/mortar and 33% for equipment. For the post-CONCAP period, hospital equity participation has been 40% of total approved capital expenditures. Therefore, the existence of CONCAP has brought about a significant savings in annual interest expense for "needed" and approved capital proposals.

Discussion

The need to contain health care costs and to maximize returns on societal investments in the provision of health care services are of considerable concern at both the national and state levels. Indeed, even the concept of national health insurance is once again gaining currency although much disagreement is evident regarding the form and funding for such a large undertaking. While debate concerning matters such as national health insurance continues, affected parties continue to pursue more narrowly focused solutions to more limited problems.

Efforts to limit expenditures on health care services are of most immediate importance to payors. The federal Medicare program, which accounts for more than half of all hospital expenditures, acted to limit expenditures on inpatient hospital care in 1983 when it implemented the Diagnosis-related Groups (DRG) per case reimbursement program. Medicare's DRG system, however, did not include payment for capital expenses that continued to receive reimbursement on a facility specific, "cost minus" basis. In recognition of the need to limit capital expenditures, Medicare, after considering a variety of positions, has recently determined that it will implement reimbursement of capital costs on a per case basis. Per case capital reimbursement by Medicare will, over a 10-year period, provide a transition from facility-specific costs to a single national per case rate by DRG.

One of the alternatives considered by Medicare was a formal process of capital budgeting for Medicare (and possible other payors) to be conducted at the state level using target budgets that would reflect affordability limits and other factors. Medicare's selection of the per case reimbursement approach undoubtedly reflects philosophical as well as operational and economic considerations The implementation and successful operation of CONCAP in Rhode Island, however, demonstrates that explicit capital budgeting is feasible from both political and operational perspectives.

Since 1985 CONCAP has been conducted in a public forum, with all parties able to observe and to participate in the process. The major capital proposals submitted by community hospitals have been debated, modified and either approved or denied according to the legislatively mandated criteria of public need and affordability. For these hospital projects, the concept of affordability has been further defined by the CONCAP limitation. As noted above in the pre- and post-CONCAP era analyses, the implementation of CONCAP has resulted in a smaller proportion of proposals being approved, a reduction in the relative amount of approved expenses versus requested expenses, and significant from the perspective of affordability, an increase in the proportion of equity funding of approved proposals. The latter result benefits the community through reduced interest expense. Perhaps most importantly the CONCAP process involves an explicitly community-based decision on major capital projects in light of a limit determined by a legislatively authorized budgetary process for hospitals.

Rhode Island's CONCAP program continues to evolve. Since its initial passage, the General Assembly has amended the statute to provide for the minimum CONCAP (1990) and the general CON process has also been amended regularly.

As the process continues to mature, additional changes likely will be necessary. For instance, as the state's health insurance market becomes more diversified, setting the CONCAP limit through the existing Hospital Prospective Budgeting Program is becoming less appropriate. Broadening the representation of payors may be desirable. Similarly, there has been ongoing interest, but as yet no agreement, among interested parties on the development of a multi-year budget. Also under consideration is the inclusion in the CONCAP process of proposals by non-hospital sponsors for major medical equipment and/or tertiary level technologies. While physician offices and other non-hospital sponsors are subject to CON for acquisition of major medical equipment in Rhode Island, the extension of CONCAP to these entities would allow hospitals to compete on an equal footing with other potential providers of services such as magnetic resonance imaging or positron emission technology scanning regarding the public affordability of such proposals.

Rhode Island's CONCAP represents a vital and at present, an unusual adjunct to its successful CON Program. CONCAP has improved decision-making by recognizing the need for setting limits on capital expenditures and by providing a process for proposals to compete for those limited resources. Other states may wish to consider the use of a similar mechanism for improving the rationality and cost effectiveness of their certificate of need programs.

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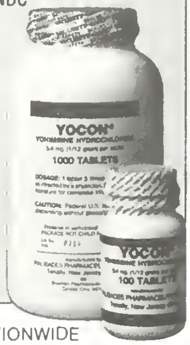

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>
> **Osler**[1]

It has long been recognized that becoming a physician involves more than the mastery of some critical courses. Within the historical context of medical education, the recent trend among educational groups and medical specialty boards to focus on the importance of "humanistic" qualities in physicians can be viewed in part as a return to basics.[2,3] One of the challenges for students is to develop acceptable, competent mastery of the technical demands of medicine, while simultaneously acquiring a foundation for future professional behavior that optimizes functioning and provides empathic patient care. A variety of advising and educational programs have been developed to address these concerns.[4-9]

The medical program at Brown University developed one such program in 1987. The Affinity Group Program is designed to develop broadening and integrating experiences within premedical and medical education and to mentor students.

Program Overview and Goals

Brown University's Program in Liberal Medical Education (PLME) is an 8-year program encompassing both the baccalaureate and medical degrees. The opportunity exists to support student development early in the educational experience and to maintain contacts over time. Affinity groups bring together students and faculty who share common interests in small groups, to meet both advising and educational goals. The program begins in the junior year of college (year 3) and continues through the end of the second year of medical school (year 6). The resulting 4-year bridge across the undergraduate and medical school years encourages a continuous mentoring experience within the group, while enabling a progression in the educational objectives.[8,9]

Advising roles are in the realm of student development in the broadest sense. Faculty and senior students help group members explore their commitment to medicine, broaden their exposure to career possibilities, select curriculum options and clarify their values.[9]

The affinity groups use an active learning format to integrate premedical and medical studies. The program builds a 4-year hierarchy of problem-based learning that typically begins in the first year with a case format, adds an interactional component with standardized patients, real patients and interpreters the next year, and over the final 2 years, encourages expansion of issues to the level of the community and health care system.[8] Most groups get "hands on" experience with community projects and studies that the students develop and carry out.

The educational template for the program places emphasis on the psychosocial and ethical domains, early exposure to patients, the need for community involvement and the facilitation of skills in problem-solving and self-directed learning. Special programs and consultants assist students in upgrading skills in the use of resources (especially the new information technologies), and in communication skills where there is extensive use of standardized patients, role plays and video camera feedback. A key element of the program leaves the specific content areas (affinities) to the discretion of the groups, thereby encouraging exploration of areas of interest for which there may be no other opportunities within the curriculum.

Groups generally consist of a physician faculty facilitator, one or more interested co-leaders (campus PhD faculty, or allied health professionals), an affinity group fellow (upperclass medical student assistant), and 6 to 10 student members. Faculty make a 4-year commitment to the program,

ABBREVIATIONS USED:

PLME: Program in Liberal Medical Education

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although co-leaders may opt to participate as resources to the group in a less intensive fashion or for less time.

The program was implemented in the fall of 1987 with eight junior-year affinity groups (year 3). In each of the next three years one new cohort was added as the previous group moved on to the next level, until in 1990, the full complement of four cohorts existed. Hence the program has had two years with the complete affinity group "bridge" between baccalaureate and medical studies. For the 1991-92 academic year, there were 29 affinity groups, spread across the four middle years of the program with more than 300 student and faculty participants.

Interest Areas of Affinity Groups for 1991-1992

The program has developed a flexible menu of options for meeting goals and objectives. Hence there is significant variety among groups in chosen pathways as well as in actual interest areas. An outline of the themes and activities of the newly formed PLME junior affinity groups in the 1991-92 academic year will help illustrate these points.

For the 1991-1992 academic year, there were 29 affinity groups with more than 300 student and faculty participants, spread across the four middle years of the program.

The eight PLME junior affinity groups for 1991-92 were organized around the following areas of interest: 1) care of our aging population; 2) international health, 3) current controversies in medical care; 4) community oriented primary care; 5) disability and literature; 6) mentoring adolescents; 7) bioethics and reproduction; 8) economic development and health in the developing world.

The first group addressed care of senior citizens by developing clinical experiences with elderly residents at Steere House, the nursing facility associated with Rhode Island Hospital. The second group, assuming that diverse communities in RI approximates issues in underdeveloped countries, approached international health by conducting a survey in a local community health center for a later project. This group received a grant from the Center for Public Service at Brown to assess the level of awareness and utilization of the Cranston Community Health Center in the area's Hispanic community. The third group used newspaper accounts of health care issues to discuss controversies in health care. Group 4 conducted a survey on prenatal care at a community health center in Cranston. Group 5 read fictional accounts of disabilities, interviewed patients at a local hospital rehabilitation unit about the impact of disability, and wrote creative stories afterwards. The sixth group collaborated with a school in Central Falls to develop individual mentoring relationships between selected students there and the affinity group members. This group also received a grant from the Center for Public Service to do programs with grade students and parents. The impetus for the formation of this group came from a graduating medical student who received an American Medical Student Association grant to support her work. Group 7focused on the problems of low-birthweight infants (including on-site experiences) and Group 8 looked at health care policy issues.

It can be seen from the foregoing, that more than half the groups had clinical experience in their junior year of undergraduate college, two received grants for their community service activities, and one established a firm link with a public school system (which other schools have asked to join in the future). Similar breakdowns of junior-year affinity group activities have been found in other years.

Affinity group activities involving PLME seniors included a study of an industrial accident, running stress management programs in the Chestnut Hill Nursing Home, a health needs assessment in the Elmwood Health Center, experiences with holistic healers, environmental contaminants, peer counseling experiences at the Chad Brown Health Center (with a grant from the Center for Public Service) and doctor/patient interviewing.

It is clear that students and faculty have sought opportunities to have early clinical experiences, to interact with community organizations and agencies, to volunteer their services, and to pursue in some depth, areas of interest that might otherwise not be addressed.

Similarly, affinity groups in 1st and 2nd years of medical school (years 5 and 6) included a mix of clinical and community experiences and more specialized topics. One group put together a brochure on tuberculosis and with a grant from the Center for Public Service, published the brochure in several languages including Spanish, Cambodian, Laotian, and Vietnamese. Another group had each member do community volunteer work of their own choosing. Working with the Blackstone Valley Center, one group helped to provide sex education for early adolescents (11 to 13 year-olds). Two groups have worked in the area of literature and medicine, one of which is trying to assemble a collection of student writings. Still another group worked with an adolescent organization as volunteers.

From these brief highlights of 1991-1992 affinity group activities, it is clear that students and faculty have sought opportunities to have early clinical experiences, to interact with community organizations/agencies, to volunteer their services, and to pursue in some depth areas of interest that might otherwise not be addressed. The affinity groups have been subdivided into broad, partially overlapping groupings: 1) issues of diversity in health care, international health, primary care; 2) aspects of health care delivery, public health, environmental health; 3) the development of the physician, the doctor/patient relationship, the stresses of medical practice; 4) use of the humanities and social sciences to broaden medicine; and 5) health care for specific populations, such as the impact of gender, age and sexual orientation obtaining health care.[8] For next year, plans are underway to include groups in the area of biomedical research, computers in medicine and the "outcomes management" approach to patient care.

Feedback on Program

Each year evaluation information is collected from program participants to monitor student performance, faculty and fellow contributions and to obtain program feedback. The participants' comments provide a profile of their views of the program.

In general, although the exact equilibration varied from group to group, participants were aware of the balance between support and educational activities that is maintained in the Affinity Group Program. Most respondents felt there was a good balance between these objectives in their group. However, a couple of groups in the busy medical school years chose primarily to emphasize support aspects and one of the undergraduate groups stressed educational objectives more than the students would have liked.

> ***Many students wrote . . . that the relationships established within the groups were key and that the activities were realistic, appropriate and exciting.***

Faculty-student interactions were highly valued. In fact, student evaluations of faculty participants were almost uniformly superlative (4s and 5s on a scale of 1 to 5, with 5 the highest). Out of 60 faculty participants, only a couple received neutral or negative ratings.

Other program aspects that were highly rated include the small group, active learning format, the interactions with fellows, the ability of groups to choose their own area of interest, the opportunity for early clinical experiences and the ability to remain with the same group over time. Students particularly appreciated the opportunity to discuss aspects of medicine that are important to them but may not be discussed in other settings due to a lack of time or direct course relevance.

Many students wrote comments about the strength of the program adding that the relationships established within the groups were key and that the activities were realistic, appropriate, and exciting. Other students felt that the time demands in the medical program preclude the possibility of using these groups effectively for educational purposes. Such students recommend confining affinity groups to the undergraduate portion of the program or limiting them to support functions.

Similarly, some students felt that the overall structure of the medical program should be revamped to provide more small group experiences, more integrative courses that cross disciplines, and more formalized early clinical experiences. These students often suggested that affinity groups assume responsibility for some of the course work or be more integrated with the standard courses. Some students felt they are too pressed for time to find affinity groups useful. Such formative feedback has led to coordination of the 1st-year medical school groups with the medical interviewing and social and behavioral science courses, and of the 2nd-year medical school groups with the introduction to clinical medicine courses, with some groups doing these courses together as an affinity group (eg, interviewing in a community oriented primary care setting). In addition, students who feel overwhelmed are provided with alternative ways to meet the affinity group program requirement.

It is clear from the feedback that affinity groups that have undertaken projects in the community are enthusiastically rated by their participants. In addition, the many unsolicited letters from community agencies, institutions and groups attest to the value the community places on their contacts with students. Students have even sought ways to supplement the official group projects. For the past 2 years students in several affinity groups across the 4 years have organized a spring break service project building homes for the needy as part of the Habitat for Humanity program. These students used the affinity group format to organize and sponsor their service project.

> ***"If you perceive the practice of medicine as being much more than the recall and application of technical facts and jargon, you already have an appreciation for affinity groups. Affinity groups deal with the "humanistic" aspects of being a physician: interpersonal interaction with patients, communicating with other physicians, and viewing patients as three dimensional human beings who have joys and worries that are outside the realm of organic disease."***
> ***(Student commentary on Affinity Groups).[10]***

Conclusion

The Affinity Group Program, now entering its 7th year at Brown, helps to form a 4-year bridge across the middle of the 8-year baccalaureate/medical school PLME continuum. Through the program, students work with faculty in small active learning groups around areas of shared interest to get a sense of the broader sweep of medicine. Key options of the program include early clinical experiences, opportunities for community involvement and service, and the chance to develop more fully the psychosocial, ethical and communication domains that are often assumed rather than taught. The opportunity to interact with patients early in the premedical/medical continuum is greatly appreciated by students, who find it helps them to better appreciate patients' perspectives on illness and care. In addition, students value highly the close bonds they form with faculty and other group members, which become powerful supports for their development.

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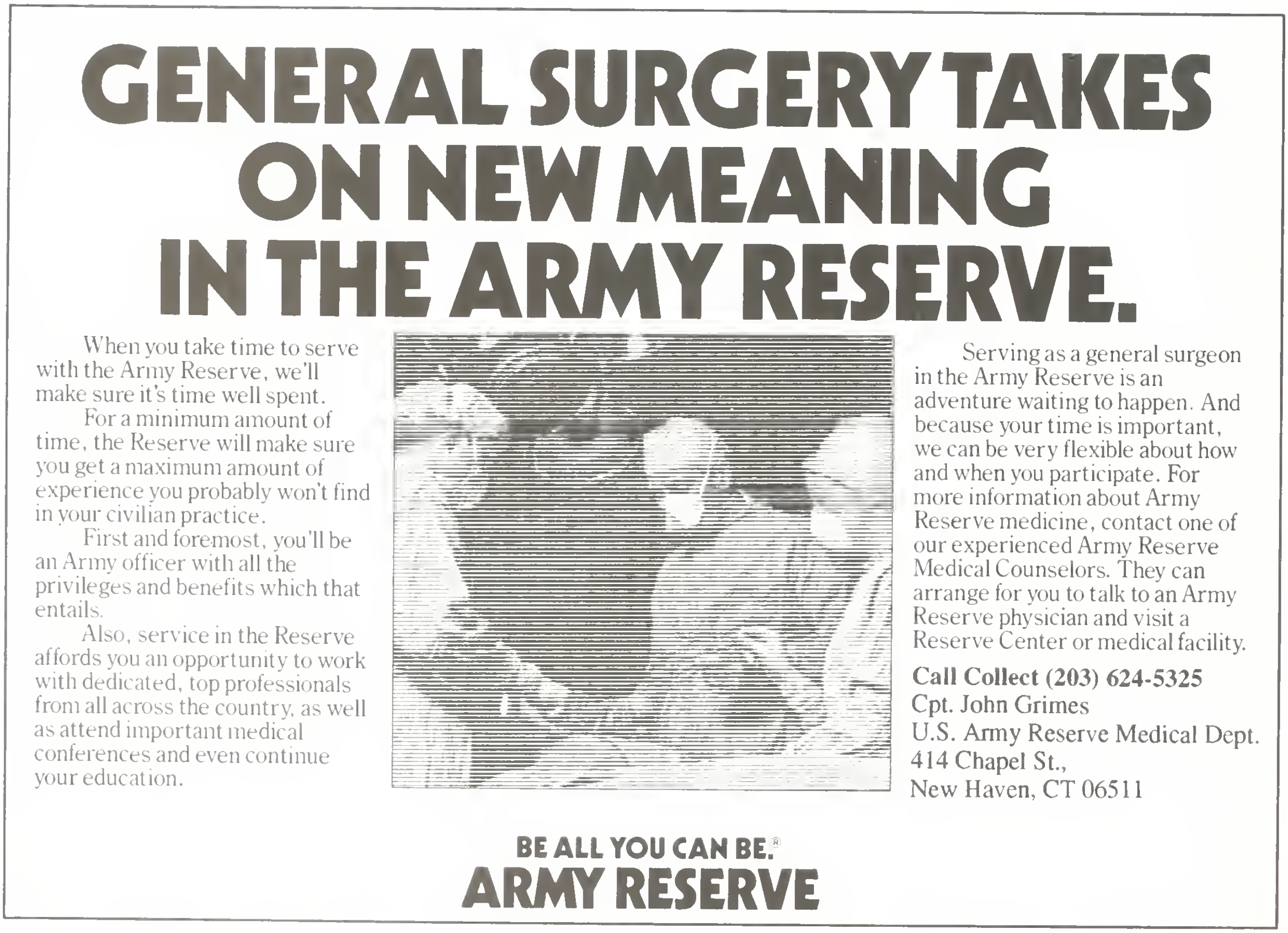

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Medical Ethics in an Outpatient Setting: Conflicting Cultural Values

Edward N. Beiser, PhD, JD

Case

A 17-year-old Cambodian female presents at the pediatric clinic with a chief complaint of dysmenorrhea. Since her onset of menarche at age 16, menstrual periods have been irregular (at intervals of 2 to 6 weeks), of variable duration (from 2 to 7 days), and with minimal flow, spotting, and severe crampy lower abdominal pain. She denies any sexual activity. She was accompanied by her mother who speaks no English. Although raised in Cambodia, the patient is fluent in English and attends public high school. A female Cambodian interpreter was present at all times for clarification and to allow the patient's mother to participate in the discussion.

The unremarkable sexual history was elicited in English to allow the patient to be candid in the presence of her mother. The physical exam was unremarkable and the pediatrician referred the patient to the gynecology clinic for an initial pelvic exam and gynecology consult. This recommendation was communicated to the patient's mother by the interpreter.

Edward N. Beiser, PhD, JD, is associate dean of medicine, Brown University School of Medicine, Providence, Rhode Island. This case was presented at an ethics teaching conference by J Tornabene, MD, during his years as a medical student at Brown. It has served as a regular and often repeated teaching case in pediatric ethics rounds. Dr Tornabene is not responsible for modifications made in the current brief presentation, and he is certainly not responsible for Professor Beiser's discussion.

Both the mother and the patient steadfastly refused, however. The mother believed the speculum exam would "spoil" her virgin daughter, and the patient was afraid because her mother told her it was "painful and horrible."

Before leaving, the patient was informed in English (without interpretation for her mother) of the benefits of having a pelvic exam at this stage in her development. An attempt also was made to allay her fears and dispel any myths by carefully explaining the procedure to her. She also was told to take some time to think it over, to contact the clinic when she felt she was ready and to return by herself at any time to discuss her concerns privately.

Discussion

This case presents a patient who refuses what the doctors view as normal, routine and essential treatment. It is complicated by the fact that the patient's mother plays a greater role than some might consider reasonable. But most basically, the case presents the rejection of the current medical standard on the basis of what many would consider primitive or outmoded views. A further complication is that the refusal (certainly by the mother, and possibly by the much more Americanized daughter) rests on group values that differ from those of the mainstream American culture, however they might have been viewed in the particular foreign country in which the mother was born.

Some might suggest that there are no ethical disputes in this case. Rather, they might say, this is a management issue. How best to have the teenager receive care of the quality which we desire for our own teenage children, friends and neighbors? From this perspective, the key issue is "that a spoonful of sugar helps the medicine go down." The issue would be: ask a physician who treats a significant number of Cambodian patients, what particular methods – what particular "spoons full of sugar," so to speak – will help the medicine go down for this population. This, they might assert is a management issue (what works), not an ethical issue.

ABBREVIATIONS USED:

AIDS: Acquired immune deficiency syndrome
HMO: Health maintenance organization

I do not, for a moment, undervalue the appropriateness of understanding management issues. However, pragmatic judgments about the management of a particular case ought not be permitted to obscure important ethical issues.

Instead of formulating the question as "how best can we get the Cambodian patient population to accept routine pelvic examinations," one might ask: Is it (and why is it) appropriate for physicians to try to modify the beliefs and behavior of their patients? Moreover, one might well ask, whether (and if so why) physicians should be required to seek to modify their patients' behavior.

These formulations suggest that what is at stake is not a value-neutral argument about what works best, but rather an explicit clash of values as to what "best" means.

One final introductory point is worth stressing. Medical educators, practicing physicians, and the mass media are aware of ethical issues involved in the practice of medicine. Many, if not all, of the issues which make it to the TV screen involve high tech medicine (eg, cardiac intensive care unit, bone marrow transplants) and also involve life and death issues.

This case presents a procedure routinely performed on an outpatient basis. It is true of contemporary medicine that many procedures that were traditionally done on an inpatient basis are now done otherwise. Those responsible for the education of medical students, house staff, and of established physicians, must be prepared to identify and address ethical issues which are significant in the world of outpatient medicine.

What follows is a discussion of some, but by no means all, of the ethical issues suggested by this case.

Does it matter that this is a pediatrics case?

This case presented at a pediatrics clinic. Would it raise the same issues if a 19-year-old had presented at the medicine clinic?

Perhaps the dominant value identified in discussions of medical ethics is patient autonomy. The legal system reflects and/or contributes to this concern through the doctrine of informed consent. The adult, competent patient, we are repeatedly told, is entitled to refuse treatment, even life-sustaining treatment. "Autonomy" is the positive word. "Paternalism" is the evil to be avoided. See George Orwell's *1984.* But in the pediatric context, "paternalism" (and "maternalism" for that matter) is a positive obligation. Parents are required to obtain proper medical attention for their minor children. Indeed, failure to do so constitutes child abuse.

For this reason, the pediatrics clinic involved the mother, not only by permitting her to remain in the room during the examination and treatment discussion, but also by providing a female interpreter.

And yet the clinic staff must have felt a tension pulling against the parental role: At key points (taking a sexual history; urging the patient to come back by herself) the translation was discontinued, explicitly so as to remove the mother from the decision-making process. Perhaps the tension between the autonomy of the 17-year-old patient and her eager and assertive mother reflects the ambiguous state of a 17-year-old in our society. Would not this be an easier case if the patient were 4 or 22? Also, one can speculate that the clinic staff felt that this patient was entitled to the same treatment options as were all of her classmates in the American high school she attends.

That is to say, the clinic staff may well have identified with norms and values regarding the status of young women in our society, which they perceived as fundamentally different from those of the traditional Cambodian mother. It is easy to say that every child is entitled to a reasonable standard of care. The word "reasonable" may appear to be an objective, value-neutral term: "reasonable medical care" is what most people would want. However, it is often the case that a "reasonableness" standard is prescriptive, asking "what *should* a reasonable patient want?"

Our society has come to say that the adult competent patient may make his or her own choices. It is clear that the language of "choice" makes no sense for newborns, or for very young children. Somewhere between these two extremes are not one but many slippery slopes.

Is gender a significant issue in this case?

We are told that a female interpreter was obtained. Is that relevant, and was it appropriate? The medical student was a male. We are not told the gender of the supervising pediatrician at the clinic. One can imagine that the patient and her mother were assured that a female physician would do the pelvic examination in the gynecological clinic.

Is it obvious that female patients should be entitled to limit their care to female doctors, nurses and technicians? If so, should male patients be able to refuse treatment by female physicians, nurses and technicians? Our experience to date is that male physicians have been presumed to be acceptable to both genders. Perhaps inappropriate stereotyping acts to disadvantage female health care providers, such that men ought not be permitted to decline treatment by females.

Perhaps obstetrics and gynecology present a unique setting in which personal or group definitions of privacy and private choice deserve particular respect. If this patient had presented at an ophthalmologic clinic, we would not be responsive to the claim of a patient – male or female – that he or she had "more confidence in male doctors," and that he or she did not want to be worked up for a retinal detachment by a female physician.

A staff attending physician at a Brown-affiliated hospital experienced a great deal of frustration in his efforts to communicate effectively with the family of an extremely ill patient. At one point the patient's sister (the closest relative) called a senior hospital official and demanded that the particular physician be taken off the case. The sister was explicit as to the type of doctor the family would find satisfactory: "We don't want any more Jewish doctors."

The senior hospital official, though feeling extremely angry at the family, complied with their wishes. It is at least plausible that the family's behavior, offensive though it was, meant that the quality of care received by the patient required a doctor whom the family would not reject out of hand. If a medical resident who was himself black or Hispanic was rejected in the emergency room by a patient who wanted a "white male doctor", my instinct might well be to turn the request down, outright. It is less obvious to me that there is something wrong with guaranteeing the patient in our case a female doctor in the gynecological clinic if she comes back for the pelvic examination.

Does it matter that the patient was Cambodian?

Americans often take pride in our individualism and in our protection of the rights of the lone dissenter. At the same time, our pluralist tradition recognizes the importance of protecting the claims of groups – at least of some recognized (mainstream?) groups.

From the purely individualistic perspective, a patient's refusal of treatment deserves to be respected. It is not for others to question the validity of the patient's choice. In practice, validation by a group clearly adds weight to the patient's claim.

A cynic might note that a patient who reports that he or she hears voices, revealing God's medical instruction is likely to be called psychotic. However, the patient who undertakes a pilgrimage to Lourdes may well be asked to bring back religious medallions for some number of his Rhode Island neighbors.

The phrase "The Ugly American" has been properly applied to the unthinking insistence that the entire world follow our lead, and that Americans who travel or work overseas can spurn the "primitive" customs of their host country. Is this more than a case of bad manners?

As a practical matter, a hospital will run more efficiently if its practices comport with the deeply felt communal sentiments of the population it serves. From an ethical perspective, group validation should alert the hospital (or other provider) that it is dealing with a matter which is of real importance to some patients, and which ought not be overlooked.

Perhaps the most minimal ethical claims is that the hospital should never be permitted to confuse the routine with the necessary. For example, reduction in the automatic use of blood products resulting from the AIDS epidemic demonstrates that claims made by Jehovah's Witnesses years ago, refusing transfusion, were incorrectly rejected in the name of scientific medicine.

Respect of the values of a group, however unconventional, requires a subtle understanding of how one joins the group, and how one withdraws. Is it relevant that our Cambodian patient goes to a public high school and speaks fluent English? The suggestion appears to be that the non-English-speaking mother is still an authentic Cambodian. She, presumably, would be entitled to continue the mores and norms of the "old country." The daughter, on the other hand, is like us. Thus she should be treated like any native-born 17-year-old.

American-trained physicians or medical students who spend time providing health care in Third World settings may confront situations in which the provision of health care strongly violate aspects of their own values. They may well be told by the philanthropic or governmental agencies that send them overseas that it is not their function to change the mores of a non-western nation. They are there to provide medical care, as best they can, within the religious and cultural traditions of their placement.

How, then, to distinguish between the standards of practice which an American doctor should apply to Cambodians living in a refugee camp in Thailand, and the standards of practice which he should apply in the care of Cambodian immigrants whom he meets in a clinic after his return to Rhode Island?

Should cost matter?

The logic of informed consent, of patient autonomy, is that the body belongs to the patient, and he or she, therefore, has the exclusive right to determine what medical procedures to undertake. "Whose Life Is It Anyway?" the play asks.

Is it appropriate, or perhaps necessary, that the physician considers the long-range financial costs to his HMO, or the Medicaid system in general? To formulate the question more precisely: Should a patient be permitted to refuse a standard, relatively inexpensive procedure, where it is likely that this refusal will lead to much more expensive treatment in the future? If so, is the refusal of a patient based upon ethnic or cultural or religious traditions deserving of more respect than the rejection by a patient purely for idiosyncratic reasons?

Is it appropriate for physicians and other health care professionals to seek to change patients' value systems?

The clinic patient declined standard medical treatment (the pelvic examination), we are told, because of her ethnic beliefs. Some would say that such beliefs are entitled to intrinsic respect, and that the caring physician needs to know his patients' values solely to enhance patient autonomy. On this view, it would be totally improper for the health care professional to attempt to modify those behavior patterns and the values they represent.

While the dedication to total patient autonomy may be consistent, there are many cases in which it will not stand up to analysis. Smoking tobacco presents an easy example. Clearly in 1992, no one would fault a physician who established as one of his goals to work with his patients to end their smoking habits. A physician whose patient suffered from an eating disorder might well define success as bringing about changes in the patient's eating patterns.

A phrase currently in vogue is "to empower." The relationship between "empowering" and "paternalism" deserves careful consideration.

Consider for example, a physician in a blue-collar setting. His patient is almost 16, and is awaiting the end of the school year so that she can go to work in the local mill. Her parents tell her that the mill is the best local employer and squelch any aspiration the young woman may have beyond minimum wages. The health care professional – be it a pediatrician, an internist, a family practitioner or the school nurse – believes strongly that the patient has real potential and believes that her family's dominance, though not even arguably child neglect, is clearly not in the patient's best interest. Is it within the proper scope of medicine for the doctor to get in to a discussion about higher education? If the doctor were to provide information about a local community college, would that be overstepping the bounds of medicine?

Consider a patient who had undergone the amputation of a leg, and whose post-operative course had, thus far, left him depressed. It is obvious that notifying the patient about a support group of others who had sustained such amputations would be within the scope of good medicine. So, too, the physician's offer to introduce such a person in the relaxed setting.

Why not then, offer to drive the patient over to the local community college and arrange a meeting with the financial aid officer so as to suggest that a college degree need not be beyond the patient's means? Finally, the doctor might arrange for this patient to meet with another young lady from a blue-collar setting, who had managed to get out from under her father's thumb.

An outside observer might conclude that "empowering" the patient to remove herself from an oppressive family situation that stifled her potential, would contribute much more to the patient's well-being than would many conventional medical interventions, even including a pelvic examination.

This analysis might well be said to justify a conscious decision by clinic doctors to "help" this Cambodian patient, and all others in her situation, to "escape" from the "old country" mores of their parents. The parents might assert that their "old country" family structure was none of the doctors' darn business.

This then leads to one final question, which, because it is overtly political, is likely to be extremely controversial. One might say that this case represents the serious exploitation of women. The speculum exam is rejected because it will "spoil" the young woman's virginity, preventing her from getting a desirable husband. This ethnic tradition is in and of itself offensive to our current sensibilities. The woman is being asked to risk her life in order to permit her future husband to be "Rambo" on his wedding night.

The mother's intervention to "save" her daughter's virginity may well reflect a correct understanding of the reaction of countrymen. Certainly a physician ought not wander into such a setting without caution and considered judgment. But does he owe it to his patient to help her move beyond what the doctor regards as exploitation? What in medical education and training will prepare physicians to take up this challenge?

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Director of Health

Screening Practices of Rhode Island Adults, 1991

A number of screening tests is effective in preventing premature mortality if performed regularly. Among these are tests for early detection of selected cancers, including Pap tests, mammograms, and physical breast exams.

The Behavioral Risk Factor Surveillance System (BRFSS), administered by the Rhode Island Department of Health under a grant from the federal Centers for Disease Control, tracks the screening practices of Rhode Island adults. The BRFSS consists of a monthly telephone survey of a representative sample of 150 Rhode Island residents ages 18 and older.

During 1991, all respondents were questioned concerning their experience with two screening procedures, blood pressure and blood cholesterol, and all female respondents were questioned concerning three additional screening procedures, Pap test, mammogram, and physical breast exam.

Most Rhode Islanders reported participating in each of these screening tests within the time periods established for analysis, ie, the previous two years for all tests except blood cholesterol, for which the previous five years was used (Figure 1). Fully 95% of adults surveyed had their blood pressure taken, the highest level for any test. Two other well-established tests, the physical breast exam and the Pap test, were nearly as common. Although screening levels for blood cholesterol and mammography fell below those of the other three tests, the use rate seen for both procedures (70%) is exceptional considering the relatively recent adoption of these tests for universal screening.

In particular, mammography rates have increased substantially in recent years in Rhode Island. Special surveys of cancer screening practices performed in Rhode Island in 1987 and 1989 showed that the percentage of women ages 40 and older who had received a screening mammogram in the past 12 months rose from 37% to 46% over the interval between the two surveys.[1] The equivalent estimate from the 1991 BRFSS for screening mammography use in the past 12 months is 57%, showing a continued rapid increase in acceptance of the procedure among women. Women also appear to be adhering to a regular schedule of screening by mammography. Of all women who reported ever having a mammogram, more than 70% had their most recent mammogram in the past year and nearly 90% did so within the past two years.

Use patterns for screening tests vary by age group, particularly in the case of mammography and blood cholesterol. The level of participation in blood cholesterol screening increases with advancing age, with the greatest increases between age groups seen among those under age 45 years (Figure 2). Nevertheless, the high level of awareness, as exhibited by relatively high screening rates for persons in their 20s and 30s suggests that these age groups may be receptive to programs to reduce or maintain cholesterol levels through exercise and diet.

Ironically, mammography use rates decline with increasing age among women ages 40 and older, with relatively low participation seen among women in the highest risk age group, those ages 75 and over (Figure 3). The pattern for physical breast exams parallels that for mammography among those ages 40 and older, with the physical exam being slightly more often reported than a mammogram. The age pattern suggests that older women are a likely target group for interventions to increase participation in breast cancer screening.

Although screening rate for all the tests considered are high, further benefits can be had through continuing increases in the proportions of persons screened regularly. A key factor in the adoption of screening regimens is the recommendation of a physician; in particular, women receiving a health professional's recommendation were found to be 18 times more likely to be screened for breast cancer at recommended intervals than otherwise similar women not receiving such a recommendation.[2] Clearly, the state's physicians have played a large role in the progress seen to date and will continue to be important participants in achieving even higher screening rates.

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Submitted by the Office of Health Statistics, Jay S. Buechner, PhD, Chief. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr, PhD.*

Fig. 1 – Participation Rates for Five Screening Procedures, Rhode Island Residents Ages 18 and Older, 1991.

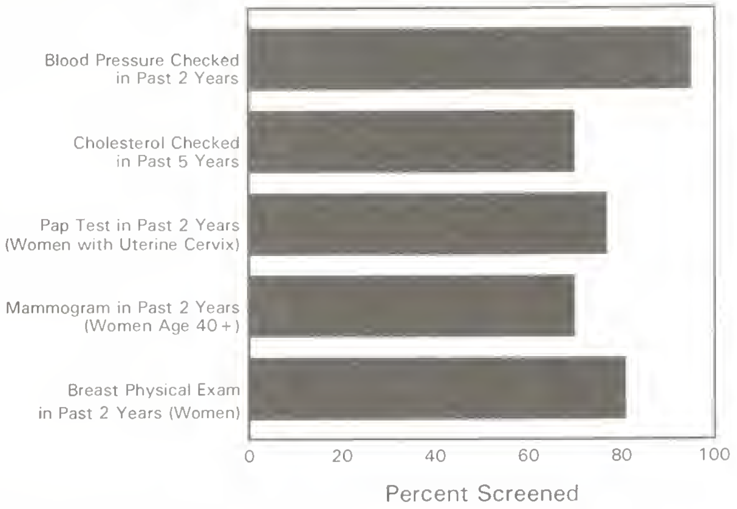


Fig. 2 – Participation Rate for Blood Cholesterol Screening in Past 5 Years by Age Group, Rhode Island Residents Ages 18 and Older, 1991

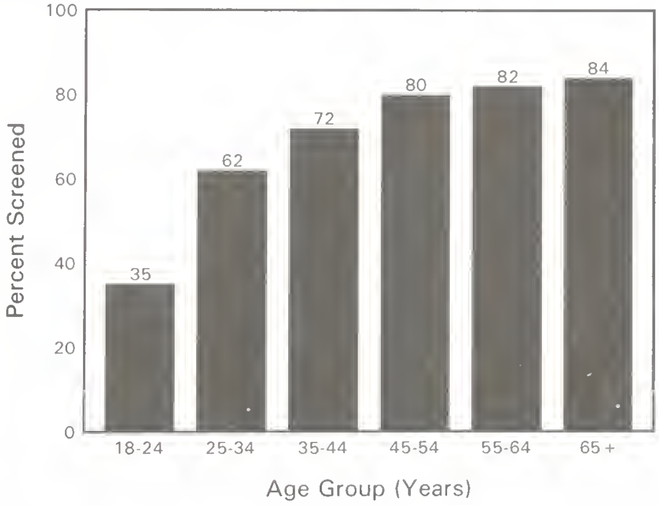
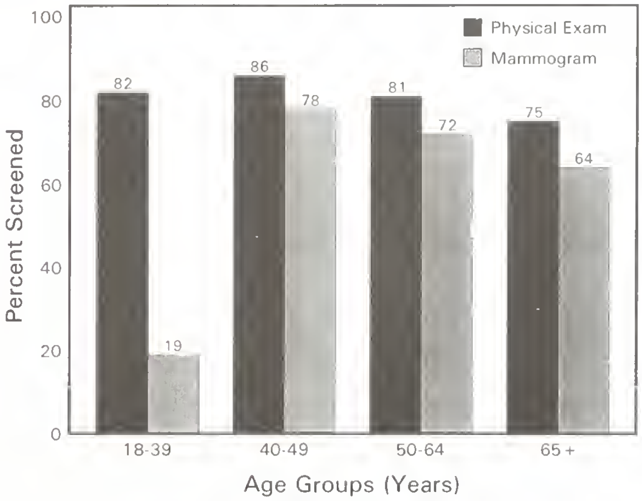


Fig. 3 – Participation Rates for Physical Breast Exam and Mammography in Past 2 Years by Age Group, Rhode Island Resident Females Ages 18 and Older, 1991



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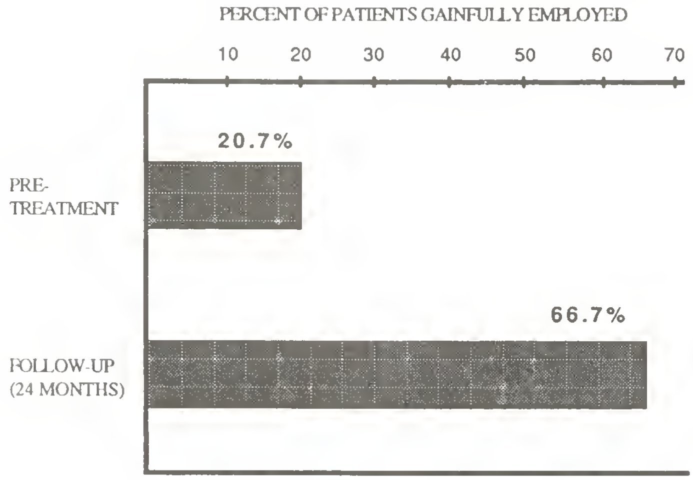

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

Ninety Years Ago
(August, 1902)

GS Mathews, MD, provided a detailed account of a case believed to be one of malignant endocarditis. The patient was a 46-year-old woman born in Ireland who sought medical help because of dyspnea, daily chills, intermittent fever, headache, limb pains and vomiting. She was hospitalized for 11 weeks but finally died. No autopsy was performed. The diagnosis of infective (or malignant) endocarditis was seriously entertained because of the following clinical features. A cardiac murmur was detected; a fever was present that was fluctuating and septic in character; and there was a peculiar discrepancy in the temperature-pulse ratio (ie, the pulse rate was disproportionately higher than the fever). There was progressive loss of muscle mass associated with weakness and pallor. Finally, there were multiple embolic phenomena with signs suggesting a terminal embolus to the right brachial artery. Petechiae were also observed and some pus was found in the urinary sediment. Multiple tests for plasmodium (malaria was initially suspected) were uniformly negative. A blood culture was also negative. Where did the infection arise? The author speculates that "it is not unreasonable to assume the existence of pyogenic organisms in the pelvic cavity, which from various causes might be liberated into the blood stream and the work of destruction be continued." The closing sentence of this detailed clinical reports as follows: "As for treatment of the case I have said nothing inasmuch as it was largely symptomatic."

Donald Churchill, MD, writes on the history of smallpox in Rhode Island. Much of the historic information, the author acknowledges, is derived from the records maintained by Dr Charles V Chapin. The first severe visitation of smallpox to Rhode Island took place in 1690, the disease raging with great violence. Public affairs faltered, the State Assembly did little business and private trade was neglected throughout the winter of 1690-91. Of all the communities of Rhode Island, Newport was the hardest hit. The disease made its appearance again in 1716, and quarantine hospitals were now constructed. Inoculation (sometimes called variolation) for the prevention of smallpox was introduced to Rhode Island in 1772 by Dr Jonathan Easton, against substantial lay and professional opposition. By 1776, each county now had a hospital where persons might go to be inoculated with smallpox, (thereby intentionally developing a mild, limited form of variola and thus achieving permanent immunity). Enterprising Rhode Islanders, at this time, conceived the idea of establishing attractive resorts next to the inoculation hospitals " . . . where young people of both sexes could go, be cared for and have a good time during the progress of the induced disease." For $6 per person, one could be inoculated, be provided with room and board during the convalescence and have access to dancing and other luxuries. "Many happy married couples dated their first acquaintanceship to their sore-arm isolation on Ram Island." Some inoculation sites even advertised the splendors of local fishing and hunting. Vaccination, a more definitive form of prevention was introduced into Rhode Island in the spring of 1801 by Dr Benjamin Waterhouse. The cow pox method of Jenner and Waterhouse was assailed and tremendously ridiculed. Claims were made (by newspapers as well as by physicians) that the vaccination virus caused patients to develop bovine features – occasionally even hoofs and horns. During the following year, Providence hired Dr Sylvanus Fansher to vaccinate its citizens. He vaccinated 4,305 persons, charging $2323.25 – or about five cents per vaccination. The vaccination program was continued in Providence by using a humanized strain of the virus, passed from person to person. Careful records were maintained of this viral passage and during the interval of 1868 to 1900, 667 transfers of virus were made. Small pox visitations continued through the 19th century with peaks in 1815, 1822, 1858, 1864 (145 cases), 1872, 1883, and 1899.

JW Courtney, MD, of Boston, Mass, offers a paper on the journalistic doctor, providing the reader a bit of dry, unexpected humor in the pages of an otherwise staid journal. The author describes how to write book reviews of recently published medical texts without reading beyond the title-page or table of contents. (He offers a menu of salutary phrases to be employed when composing comfortable, laudatory reviews, phrases which have not died: they can still be found in contemporary book reviews.–Ed)

Fifty Years Ago
(August, 1942)

In the year 1942, the Rhode Island Medical Society established the Annual Charles Value Chapin Oration. The society chose Timothy Leary, MD, Professor of Pathology Emeritus at Tufts Medical School and Medical Examiner of the County of Suffolk (Boston). Before embarking upon an inquiry into the causes of atherosclerosis, Dr Leary first plays great tribute to the personality and contributions of Chapin particularly in clinical epidemiology and public health measures designed to lessen the morbidity and mortality from infectious diseases. In his tribute, Dr Leary mentions, in passing, the emergence of new antibiotic drugs such as gramicidin and penicillin that may, in his judgment, be instrumental in diminishing the continuing menace of infectious disease.

Leary first reviews the various theories in the pathogenesis of atheromatous change in arteries, emphasizing (and advocating) Aschoff's contention that chronic injury to arterial intima is the basis for the escape of plasma lipids into the subintimal tissues with subsequent degeneration to cholesterol. The work of Anitschkow and others produced atherosclerosis experimentally by feeding rabbits excessive cholesterol. He contends that endocrine differences account for the lower rates of atherosclerosis in the human female. Most of the lecture is devoted to studies on coronary atherosclerosis, its progression and its effects upon the patient's clinical course.

RF Ronchese, MD, describes a case of dermatitis caused by phenolcamphor applied to the skin for the treatment of athletes' foot.

An insertion, without further comment, quoting one of the leading surgeons of the day: "We suspect that the emphasis often placed upon the cancerigenic influence of the tobacco habit is to some extent influenced by the ubiquitous moralistic propaganda against the filthy weed. One often encounters similar Puritanic emphasis with regard to the role of alcohol in the causation of disease."

An editorial notes with pride that Marshall N. Fulton, MD, has just been commissioned as a major in the United States Medical Corps and has been assigned to Walter Reed Hospital as chief of the cardiovascular, renal and electrocardiographic divisions.

A further editorial notes significant differences between the roles of Rhode Island physicians in World Wars I and II. In the former, Rhode Island doctors were sent only to the British Isles. In 1942, however, the geographic menu might include stations in Europe, North Africa, Arctic North America or Australia.

This issue of the *Rhode Island Medical Journal* carries the names of the physicians, nurses and administrators from Rhode Island Hospital forming the cadre of the US Army 48th Evacuation Hospital. Staff physicians include many whose names are well known to the physicians currently practicing in this state: Drs Mahoney, Lawson, Gibson, Stone, Beardsley, Martin, Melvin, Conde, Dziob, Campbell, Jones, Teahan, Clark, Zecchino, Darmajian, Webster, Fischer, Holdsworth, Perry, Manter, Korb, Cutts, Murphy, Leet, Baronian, Dillon, Congdon, Hollard, Squier, and Beck.

JF Kenney MD, writes on how a tumor clinic should function in a small hospital. EW Benjamin, MD, describes the indications for roentgen therapy, and GR Fox, MD, records the medical indications for radium therapy.

Twenty Five Years Ago
August, 1967)

The leading article is the 1967 Annual Chapin Oration (the 26th such Oration) given this year by Howard A. Rusk, MD. The paper is entitled Sick People in a Troubled World. Rusk first pays tribute to the immense contributions of Rhode Island's Congressman John Fogarty,who had just died. The substance of Rusk's paper describes the health conditions in a far off place called Vietnam. Rusk, on the invitation of President Lyndon Johnson, visited Vietnam in 1967. He describes the paucity of trained health care workers and the poverty of physical facilites in southeast Asia. He ends his oration with a quotation: "Not to destroy but to construct, I hold the unconquerable belief that science and peace will triumph over ignorance and war; that nations will come together not to destroy, but to construct, and that the future belongs to those who accomplish the most for humanity." The words are by Louis Pasteur.

Hisashi Tamura, MD, describes the pathologic features and clinical progression of nine cases of lobular carcinoma of the breast, both in situ and infiltrating.

Treatment of six cases of acute iron intoxication with the chelating agent deferoxamine is described by RD Coli, MD, LA Leone, MD, and MM Albala, MD.

Jeannette E. Vidal, MD, describes the home care pilot program in Kent County Memorial Hospital and the savings which this effort generates.

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September 1992
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Tuberculosis

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Marguerite A. Neill, MD

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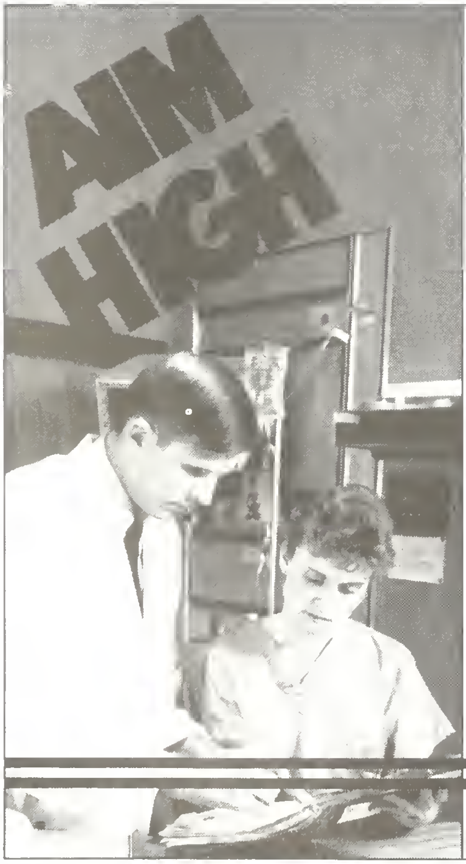

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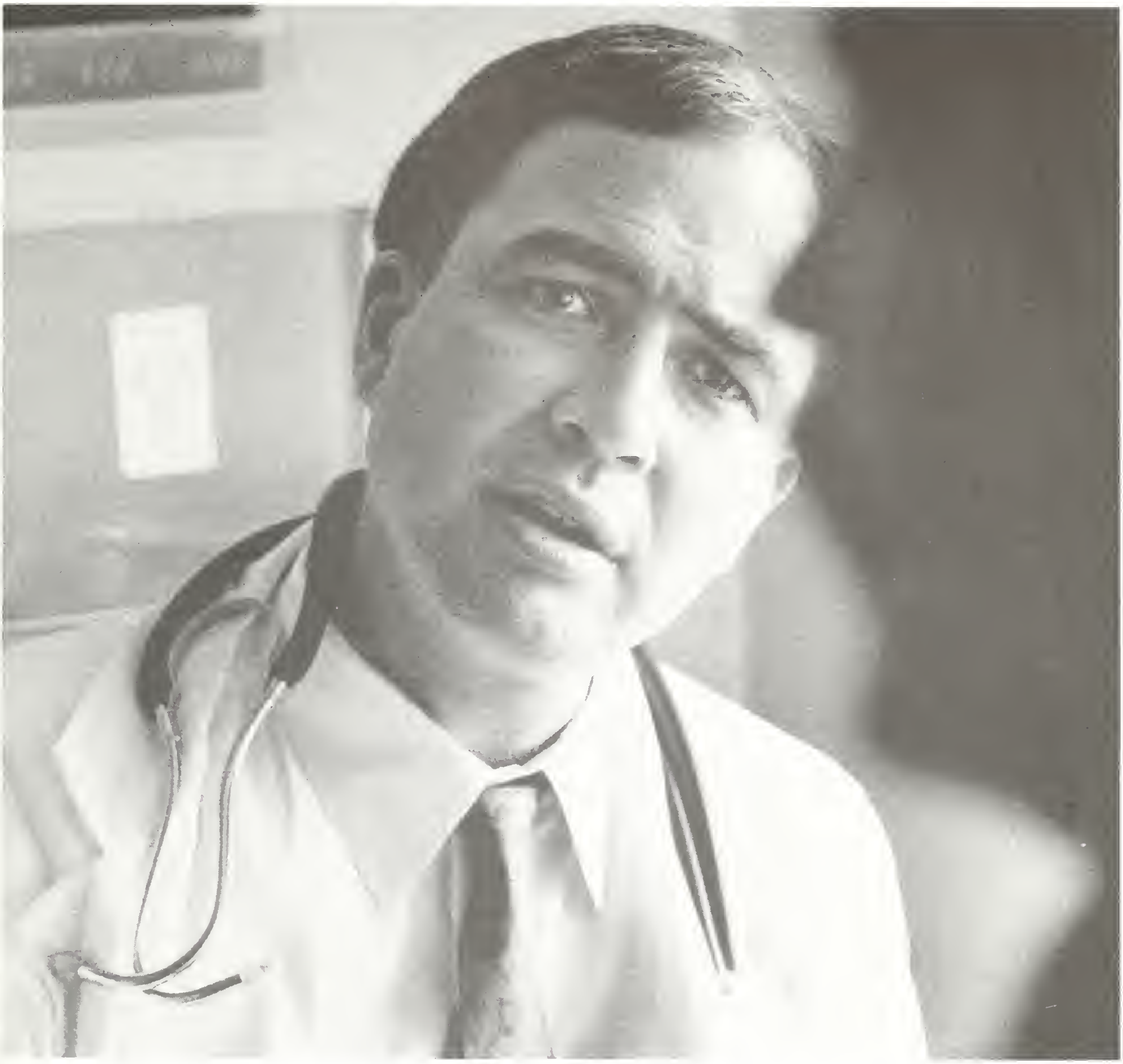

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Cover: "And always there were the poor." Photo courtesy of the American Lung Association.

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COMMENTARIES

Nothing will ever be attempted if all possible objections must be first overcome.

Samuel Johnson

Red Storm Rising

The past half-century in the United States will be a rich source of medical parables for future generations. Principal among them will be the Parable of Tuberculosis. The story opens at the close of the last century when the attitude toward consumption was one of hopelessness. This view changed ultimately to complacency by 20 years ago. Now in *fin de siècle* America, the consequences of complacency have given us another outlook–fearful alarm. How did we come so far and why has the path of progress become slippery?

The beginning of the 20th century saw the establishment of sanatoriums in the belief that fresh air, rest and good nutrition were beneficial. They also had the highly desirable effect of isolating patients and stopping transmission. Together with major educational efforts by the early anti-tuberculosis societies to teach about cleanliness and good health habits, the mortality rate of tuberculosis actually dropped by 33%. Bricks with the words "Don't Spit on the Sidewalk" were cemented into the sidewalks, and "Don't" cards with advice on what to do and not do to remain healthy were widely distributed. The development of Christmas seals in 1907 by Emily Bissell unleashed a broad-based volunteer effort that was formidable–the first year's campaign raised more than 10 times the original monetary goal. And that was after the newspaper editor whom she petitioned for help had politely shown her the door!

In the 1940s, the development of X-ray film and machines suitable for mass surveys led to the large-scale screening that previously had been impractical. Almost concomitantly, Dr Florence Seibert purified a stable form of tuberculin (purified protein derivative) which could be standardized for skin testing. These two advances allowed earlier diagnosis of tuberculosis, but they also had a profound impact on the way personal health was viewed–that an individual, in being screened to benefit himself, was also contributing to the common good.

The Holy Grail of the anti-tuberculosis movement arrived in the 1940s and 1950s with the arrival of effective drug therapy: first, streptomycin, then para-aminosalicylic acid, and later isoniazid. The focus shifted to defining the most effective combination of drugs and the duration of treatment. Slowly, resources were siphoned away.

Against the backdrop of a declining case rate and the successes of antituberculous therapy, the disease took a predictable turn, hiding in the nooks and crannies of society where poverty lives. Tuberculosis by the 1970s became defined by the word "disenfranchised" and those population groups without forceful advocates were the faces of tuberculosis: the poor, the refugees and immigrants, the drug users, the homeless. Their lack of access to medical care was dry tinder for a resurgence of tuberculosis, and it took only the spark of HIV to fuel the fire. As noted in *Newsweek* (March 16, 1992), "Its resurgence is neither fluke nor mystery, but a tragic social failure."

Tuberculosis is no longer somebody else's problem–it is ours, right here in Rhode Island. The reported number of cases has been steadily increasing, multidrug resistance has appeared, and, ominously, cases of pediatric tuberculosis are occurring. Childhood tuberculosis signifies ongoing active transmission in the community, and its occurrence is the alarm bell that control programs are not working.

The contributors to this issue of *Rhode Island Medicine* have tried to make you pause–stopping for a few moments to remember information

ABBREVIATIONS IN THIS ISSUE:

AAP: American Academy of Pediatrics
AIDS: Acquired immune deficiency syndrome
ATS: American Thoracic Society
BCG: Bacillus Calmette Guérin
CDC: Centers for Disease Control
DOT: Directly observed therapy
DNA: Deoxyribose nucleic acid
HIV: Human immunodeficiency virus
INH: Isonicotinic acid hydrazide
MDR: Multi-drug resistant
PCR: Polymerase chain reaction
PPD: Purified protein derivative
PZA: Pyrazinamide
SGOT: Serum glutamic oxaloacetic transaminase
STD: Sexually transmitted disease
TB: Tuberculosis
TU: Tuberculin unit

about tuberculosis, a few more to review your own efforts in screening patients. None of the articles minimizes the social and economic problems that confront tuberculosis control efforts, but the common thread to these articles is that the plan to eliminate tuberculosis is spread out before us.

We, as physicians, are poised at a unique moment of empowerment for ourselves and for the society in which we live. Simply put, we each can work at the grassroots level to eliminate tuberculosis in the ways best suited to our individual medical practices and our personal temperaments. We can provide our skeptical brethren with the evidence that not all social and health care inequalities must be tolerated.

Although the photograph on the cover was taken many years ago, it is highly pertinent to the situation today. The toddler in the tenement will grow up to develop tuberculosis unless we decide that his steady gaze should be into a future that preserves hope.

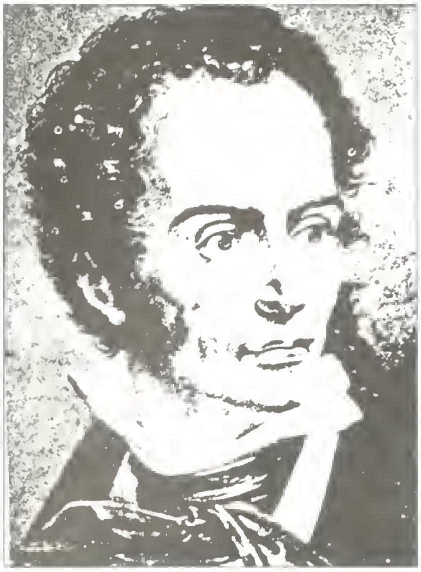
The challenge to carry out this plan is a test of our willingness and ability as a society to respond to a very serious health problem that disproportionately affects its disenfranchised members. A great nation such as ours can carry out this plan. It is time to commit to a tuberculosis-free society!

Advisory Committee for Elimination of Tuberculosis

Acknowledgement

I wish to acknowledge the invaluable assistance provided by Colette Meehen in the preparation of the manuscripts appearing in this issue of *Rhode Island Medicine*.

Marguerite A. Neill, MD
Guest Editor



RTH Laënnec, 1781-1826

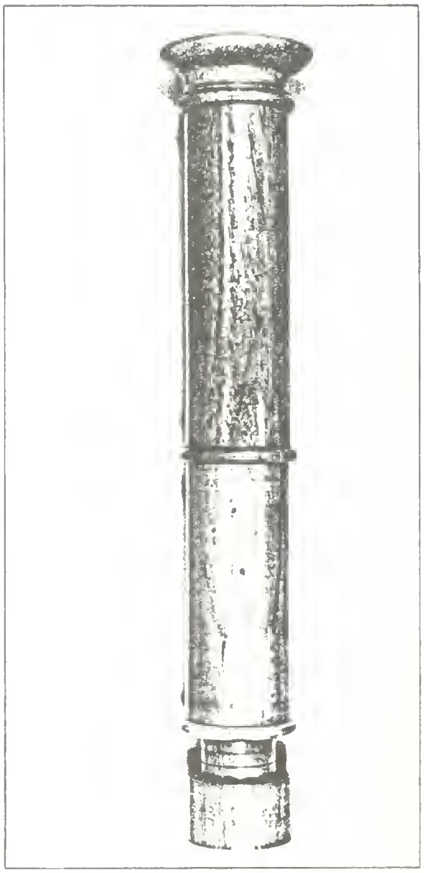
RTH Laënnec: A Life Immersed in Tuberculosis

Long before the infectious nature of tuberculosis was demonstrated experimentally (JA Villemin, 1865), its pathogenic agent identified (R Koch, 1882) and its acid-fast staining technique devised (P Ehrlich, 1882), a young tuberculous physician from Brittany named Laënnec provided the scientific world with a convincing and embracing concept of the pathogenesis of this consuming disease.

In 1804, at a time when phthisis was regarded by the medical profession as at least six distinguishable diseases, all somewhat hereditary, Laënnec proposed a unifying vision: that the small greyish pulmonic tubercles, the enteric ulcers, the caseous cervical lymph nodes, and the large, periodically hemorrhagic, lung cavities were separate faces of the same disease called phthisis. It would be another 35 years before Schönlein recommended a new name, tuberculosis, for this protean disorder.

Laënnec's other great contribution to the science of cardiopulmonary medicine was his invention of an inflexible tubular contrivance to channel and augment internal thoracic sounds to the discerning ear of the listening physician, a process he called intermediate auscultation (L. *auscultare*, to listen to). Direct, or mediate, ausculation (ie, with the physician's ear directly upon the chest), had been known and irregularly practiced for centuries, perhaps millennia.

Laënnec coined the word stethoscope (Gr., *stethos*, breast; and *skopein*, to examine) to describe his new instrument. He experimented first with paper cylinders but found that a hollow, lathe-turned tube of hard wood better suited his purposes. Our more familiar, flexible, binaural, resonating stethoscope represents a 19th century sequence of incremental improvements; but because of their reverberating tendencies, the newer instruments initially were condemned by the advocates of the older monaural device. The currently used standard model embodies some refinements offered by two Americans, Robert Bowles and Howard Sprague (ie, the provision of



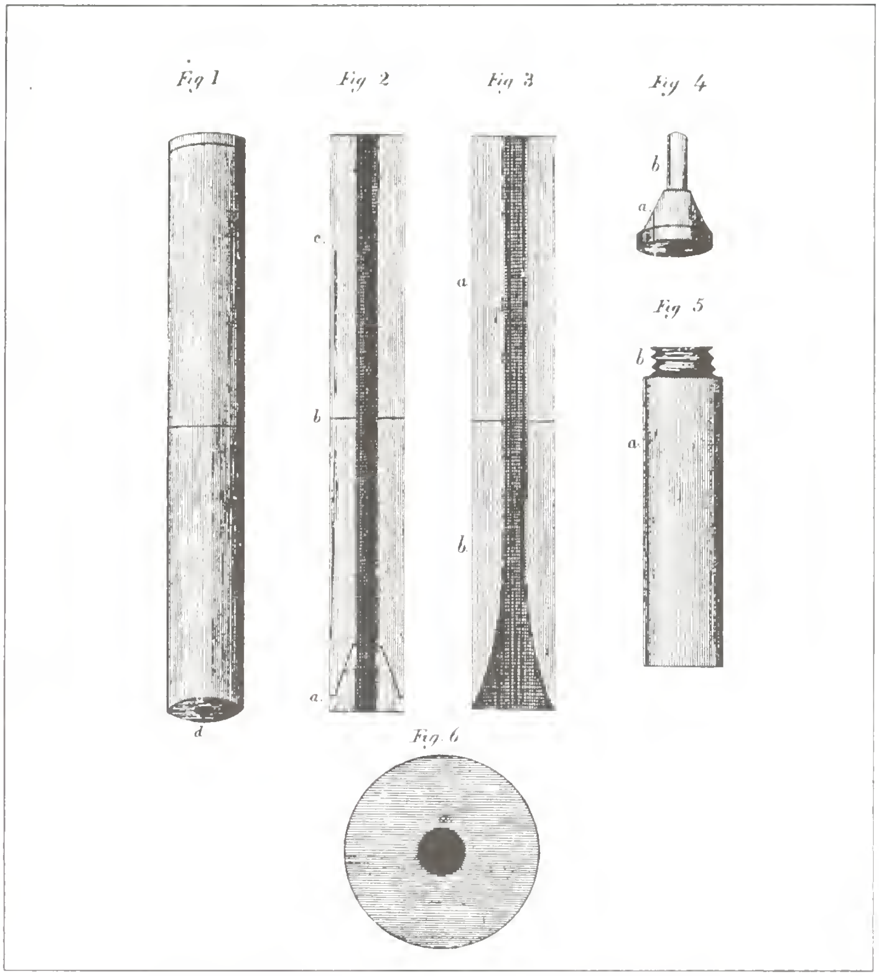
An early stethoscope.

two auscultatory options in the same instrument: a sensitive diaphragm for high frequency sounds and a bell-shaped head to better detect sounds of low frequency). In the century that followed Laënnec's critical invention, many detailed studies were undertaken to analyze the acoustic properties of thoracic sounds. It was determined, for example, that best results are achieved when the internal diameter of the sound-conducting tube is 1/8 inch and the tubing no greater than 10 inches in length. If wood is used in the construction of the stethoscope, then low-density woods best preserve the transmitted sounds.

Laënnec's detailed description of his auscultatory findings, including a precise account of râles and rhonchi, was published in 1819 in a memorable text called, *De L'ausculation Médiate ou Traité du Diagnostic des Malaidies des Pumons et du Coeur fondé Principalement sur ce Nouveau Moyen d'Exploration.* The two volumes provide elaborate accountings of the transmission of vocal sounds through normal and diseased chests; the transmission of bronchial and post-bronchial respiratory sounds in normal and diseased circumstances; the detection of effusions within the pleural and pericardial cavities or within the pulmonic parenchyma; and an analysis of cardiac and valvular sounds in various disorders of the heart, its valves and the proximal aorta. The antemortem physical findings characteristically are accompanied by detailed post-mortem descriptions, assigning distinguishable auscultative findings to certain underlying pathologic states. Laënnec thus created a rational basis for the clinical recognition of such thoracic disorders as empyema, pleural effusion, pulmonary edema, parenchymal consolidation, emphysema, bronchectasis and cavitation. He noted, for example, that the patient's spoken voice is clearly transmitted only when the stethoscope is applied directly over a pulmonic cavity, a phenomenon he called pectoriloquy.

Laënnec appropriated the French word *râle* to describe adventitious respiratory sounds that he detected through his stethoscope. His ear detected diverse forms of râles; these sounds were then designated variously as crepitant, sibilant, dry, amphoric, or metallic, among others. The word *râle*, in French, signified rattle, which many of his patients mistook to mean terminal, premortem sounds. Laënnec then substituted the word *rhonchus* (Gr., meaning snoring) to assuage his patients' anxieties. In current English usage, however, a rhonchus is taken to mean a coarse sound arising from secretions within the larger bronchi.

One of Laënnec's teachers, the great pathologist-clinician Nicolas Corcisart, (later to become Napoleon's chief physician) encountered a near-forgotten 18th century German treatise first describing the procedure of thoracic percussion. This diagnostic technique had been introduced by Leopold von Auenbrugger, a Viennese court physician born in 1722. Historians have speculated that Auenbrugger's fascination with the subtle qualities of sound may have been derived from his musician-mother as well as his inn-keeper father in Graz who routinely percussed the sides of his large beer barrels to determine their fluid levels. At age 39 Auenbrugger published his text, *Inventum Novum* detailing the character of the sounds generated by striking the patient's chest with rigidly held fingertips – either directly or with a dense, intervening object such as a flat piece of ivory or one's finger resting upon an intercostal space. He noted varying degrees of resonance or dullness associated with subjacent pleural fluids, parenchymal consolidations and



Laënnec's stethoscope (De l'auscultation, Paris, 1819) cavities. A half-century later Corvisart translated and disseminated Auenbrugger's procedure (*Nouveau Methode pour reconnaitre les maladies internales de la poitrine*). Only then did percussion finally become an indispensable element in the routine physical examination of the patient.

It is somewhat ironic that René Théophile Hyacinthe Laënnec's name is best preserved in history though his incidental description of a contracted, hobnail liver in a patient with extensive pleurisy. Because of the orange-yellow color of the cross-sected liver, he proposed the name cirrhosis (Gr., *kirrhos*, tawny orange) for this disorder.

Laënnec's professional life was tragically brief. He died when he was but 45. Troubled throughout his youth with bouts of tuberculosis, Laënnec finally succumbed to pulmonic tuberculosis in 1826. In his brief life he was an accomplished linguist (thoroughly mastering many languages including Celtic), a fine graphic artist, a serious musician, and arguably the leading pathologist-clinician of the early decades of the 19th century.

Stanley M. Aronson, MD

A sketch of John Keats, 1819, by Joseph Severn

John Keats: Poet, Surgeon and Consumptive

Of the many myths surrounding tuberculosis during the 19th century, none was more bizarre than the fervent conviction that the disease quickened creative faculties, and that from its wasting trajectory a febrile genius was somehow liberated.

Certainly many of the seraphic voices of the Romantic Era were consumptive. The lives of Keats, Shelley, Sterne, Schiller, the Brontë sisters, Thoreau, Chekhov, Stevenson, Lanier, Chopin and Paganini all were touched, and surely abbreviated, by the white plague of tuberculosis. Tuberculosis and the fine arts were indeed so closely intertwined in the preceding century that Elizabeth Barrett Browning, herself a consumptive, once remarked, "Is it possible that genius is only scrofula?" But tuberculosis, scrofulous or pulmonic, also killed large numbers of anonymous, everyday folk who could not distinguish a sonnet from a sonata.

Available documents from the early 19th century indicate that tuberculosis annually killed about 400 per 100,000 residents in such urban centers as London, Manchester, Philadelphia and Boston. A prominent London physician, Thomas Young, states in 1815: "Of all hectic affections, by far the most important is pulmonary consumption, a disease so frequent as to carry off prematurely about one-fourth part of the inhabitants of Europe."

Eichna recently reviewed the patient records of Bellevue Hospital, New York City, for the interval 1866 to 1868. Tuberculosis (then called *phthisis pulmonalis*), accounted for 14.3% of all admissions and 30.7% of all deaths. The diagnosis frequently was substantiated by post-mortem examination. (The autopsy rate in those days was 57%.)

An unsentimental statistician, therefore, might reflect that if tuberculosis had accounted for over one-fourth of deaths during that era, it should then not come as an epidemiological surprise if one-fourth of the Romantic Era poets were also mortally consumptive. And yet we cannot but be drawn to the image of a vulnerable Adonais and to the brief, hectic lives of those who gave affirming, poetic voice and spirit to this century. Keats, preeminently, symbolized those who never had first-hand knowledge of old age and who, in the words of Shelley, would never experience:

> A heart grown cold, a head grown gray in vain;
> Nor, when the spirit's self has ceased to burn,
> With sparkless ashes load an unlamented urn.

John Keats, whose life numbered only 26 years, was born in Finsbury, a small suburb of London, on October

31, 1795, the son of a local hostler. Frances Keats, John's mother, was widowed at age 29. The family had sufficient funds, nevertheless, to send young John at age 8 to a private school in Enfield, some 10 miles from London. A few years later, Frances took ill with consumption, and young John returned from his boarding school to attend personally her terminal illness.

In the early autumn of 1811, John left Enfield to begin a 5-year bound apprenticeship to Thomas Hammond, registered surgeon and apothecary in Edmonton, a town a few miles from Enfield. It was during this time that Keats engaged his passion for poetry and classical literature. At age 17 he completed a translation into English of Virgil's *Aeneid.* By age 19, all his older relatives had died, reducing his family to three brothers and a younger sister.

In the autumn of 1815, Keats applied for and was admitted to the medical school of Guy's and St Thomas's Hospitals, London, for training in surgery. The extant records indicate that Keats completed all preliminary requirements and paid his expected tuition. Following a series of lectures in Anatomy, Surgery, Botany, Materia Medica, Chemistry, Pathologic Anatomy, the Practice of Medicine, and Midwifery, he graduated to the role of surgical ward dresser. In this capacity he was given responsibility for the care of post-operative patients and particularly for maintaining their dressings. Keats's principal teacher was the great surgeon Astley Cooper. Richard Bright, the chronicler of chronic renal disease, was a contemporary student at Guy's. Another fellow student of Keats was Thomas Wakly, later to be founding editor of *Lancet.*

Toward the end of July 1816, Keats submitted himself for the oral qualifying examinations in Apothecaries' Hall, London. His responses to the many questions apparently were satisfactory to his examiners, the Worshipful Masters, and he was immediately granted a license to practice medicine within the United Kingdom of England, Scotland and Ireland. Keats's last surgical procedure was the opening of a man's temporal artery, for unstated reasons. In a letter to a friend at this time, he declared: " . . . and I never took up the lancet again." His alienation from medicine, however, was apparent to him even before the completion of his formal training. We learn in yet another letter to a close friend, "The other day during the lecture, there came a sunbeam into the room, and with it a whole troop of creatures floating in the ray: and I was off with them to Oberon and fairyland."

During the next half decade, young Keats traversed England and Scotland with his close friends, corresponded extensively and wrote enduring poetry such as Endymion and Hyperion, much of it maligned by contemporary literary critics. Neither his writings, his metaphors, nor even his voluminous correspondence showed any tangible influence of his 6 years as a surgical apprentice and medical student.

Keats's health ebbed during the autumn of 1819. Coughing spells, melancholy, episodes of fever, and marked pallor were evident to his circle of friends. Keats relied little upon his medical training when he chose laudanum to treat himself. Only when his cough was productive of gross blood – arterial blood, he specifically noted – did his prognostic judgment re-emerge, and he realized the gravity of his waning health. He then sought medical help, and was bled repeatedly and placed upon a near-starvation diet free of protein-rich foods. Despite these therapies, Keats managed somehow to survive the winter.

Keats was determined to leave the hostile cold and mists of London and to convalesce in a more congenial climate. With Joseph Severn, his painter-friend, he booked passage on the Maria Crowther, a small British sailing vessel, arriving in Naples, Italy, after a trying sea voyage of 6 weeks.

A distressingly painful carriage ride brought Keats and Severn to Rome, and to their lodgings in Piazza di Spagna. By December 1820, Keats deteriorated further, moving closer to his microbiological destiny. He experienced repeated pulmonary hemorrhages and was again treated by venesection, removing 8 ounces of blood at a time. Dr James Clark, physician to the English colony in Rome, also removed his access to laudanum and further restricted his diet.

The end came after 2 painful months of what Keats termed his "posthumous existence." When terminal, he requested the following for his tombstone: "Here lies one whose name was writ in water." On the late evening of Friday, February 23, 1821, Keats quietly died in the arms of his friend Severn. An autopsy was performed the following morning (confirming the existence of far-advanced, bilateral pulmonary tuberculosis) and Keats was buried outside of Rome in the Protestant cemetery near Mount Testaccio.

Another poet said of Keats:

> . . . till the Future dares
> Forget the past, his fate and fame shall be
> An echo and a light unto eternity.

Stanley M. Aronson, MD

Errata

Table 2 in the article "Brown University School of Medicine Class of 1992," published in the July 1992 issue of *Rhode Island Medicine*, should have indicated that 10 graduates of the Class of 1992 of the Brown University School of Medicine will enter family medicine.

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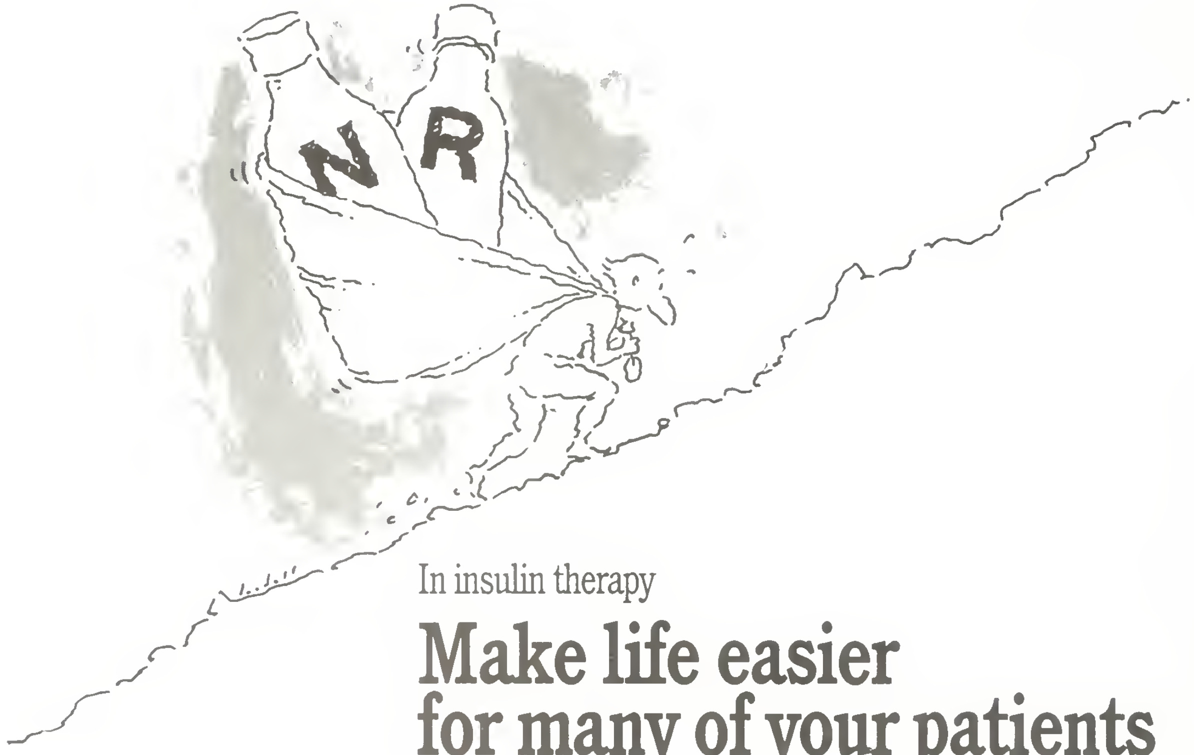
MEDICINE

Obesity

Frank J. Schaberg, Jr., MD
Guest Editor



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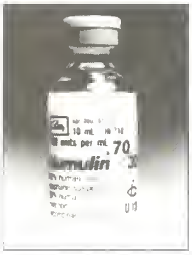

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First Do No Harm

John A. Sbarbaro, MD, MPH

Failure to comply with treatment can quickly turn a successful treatment regimen into a disastrous treatment failure.

Tuberculosis is back! And some American physicians, nurses and their fellow health care workers again risk acquiring an untreatable disease–a disease once capable of killing two-thirds of its victims within 4 years of onset, while leaving half of the survivors to continue to spread infection to others.

This scenario should have been impossible. After all, in 1947, following 5,000 years of various medical treatments (all ineffective), something actually worked–streptomycin. This discovery launched a 40-year era of aggressive and effective chemotherapy. Carefully controlled prospective studies identified the most potent combination of drugs to overcome the natural mutation rates of genetic resistance to individual antibiotics. Successful outcomes, with ever shorter durations of treatment, seemed assured.

On the dark side, however, by 1965, these investigators had come to recognize that many patients did not follow their physicians' recommendations. At least 35% of patients would not adhere to their drug regimen. Perhaps most discouraging, physicians could find no distinguishing features to identify non-compliant patients. Unfortunately, failure to comply with treatment can quickly turn a successful treatment regimen into a disastrous treatment failure.

Despite this knowledge, physicians continued to treat tuberculosis in the same way they treat heart disease, diabetes and high cholesterol. They advised patients as to the best course of treatment but left the final responsibility for completing therapy in the patient's hands.

Contagious patients, shedding drug resistant organisms, clearly affect the right of others to be free of disease.

Bad choice! Left to their own devices, patients often would take only one anti-tuberculosis drug, which killed off the organisms sensitive to it. They skipped the second drug that would have eliminated those mycobacteria that were genetically resistant to the first drug. The result was progressive replication of resistant bacilli, culminating in a new and large population of organisms not only resistant to the first drug but harboring new genetic mutants resistant to the second drug as well. And so the process would continue–drug by drug, resistant strain to resistant strain–returning us to an era of totally drug resistant, untreatable pulmonary tuberculosis.

The premier ethical tenet of our profession is:

"First Do No Harm"

Yet we have done it! We have allowed immense harm to fall upon our patients, their families and other contacts, upon our society and ultimately upon ourselves. Obviously the treatment of tuberculosis should never have been left in the patients' hands nor should it be in the future. Contagious patients, shedding drug resistant organisms, clearly affect the right of others to be free of disease. Communicable disease laws recognize this fact and require public health officials to protect the uninfected from the diseased.

As a physician community we recognized the high rates of patient noncompliance yet did not take the steps necessary to insure adequate treatment by insisting that all tuberculosis patients have each dose of their medication directly given (administered) by a third party. We allowed public health officials to shrink from their responsibility to the public. And worse, we added to the problem by privately treating our patients as if their public health disease was their personal problem.

It is clearly time to reverse this process. Physicians must insist upon the existence of an effective public health tuberculosis program in their community. Once the program is in place, physicians must monitor its effectiveness closely and, in turn, insure that both they and their patients fully cooperate with every aspect of the program.

Only through active and aggressive physician leadership can we protect our patients, and in this case ourselves as well, from falling victim to a deadly and needless disease.

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Epidemiology of Tuberculosis in Rhode Island

Rodrigo Romulo, MD

The greatest increase in tuberculosis rates in Rhode Island has occurred in Asians.

The rising tide of tuberculosis in the United States has not spared the Ocean State. Rhode Island's increasing number of reported tuberculosis cases, however, differs from the nationwide trend in both qualitative and quantitative aspects. Although comparatively small numbers of cases have been reported in Rhode Island, the rate of increase in the past few years has been greater than that for the United States as a whole. The total number of tuberculosis cases in the United States increased 15.8%, from 22,201 in 1985 to 25,701 in 1990. In Rhode Island, the total number increased 41.5%, from 53 cases in 1985 to 75 cases in 1990. Rhode Island's relative ranking in tuberculosis case rates rose from 31st in 1985 to 26th in 1989. In 1990 the 9.4% increase in reported cases nationally was the largest annual increase in tuberculosis morbidity since uniform national reporting began in 1953. In the same year, tuberculosis incidence in Rhode Island rose by 31.6%.

Role of HIV Epidemic

While the human immunodeficiency virus (HIV) epidemic is considered to be a major contributor to the resurgence of tuberculosis nationally, HIV has played a less prominent role in tuberculosis in Rhode Island. Only 12 cases of AIDS with tuberculosis were reported between 1985 and 1991. It is worth noting, however, that since AIDS became a reportable disease in 1985, there has been an upward trend from no AIDS/TB cases in 1985 to 5 cases in 1991. The lack of many patients with symptomatic coinfections with HIV and *M. tuberculosis* may relate to the lower incidence of AIDS in Rhode Island compared to other states. The 1990 crude incidence rate for AIDS in Rhode Island was 8.8/100,000 population compared to the incidence of 17.2/100,000 nationally and 26.7/100,000 for the Northeast. However, with the tuberculosis situation already worsening in a state with a relatively low HIV incidence, the importance of attempts to limit the spread of HIV is evident. Increased spread of HIV into Rhode Island's population most likely would lead to further aggravation of the tuberculosis problem.

Race and Ethnicity

From 1985 to 1990, reported tuberculosis cases in the United States increased in every racial or ethnic group except non-Hispanic whites and American Indian/Alaskan Natives. This pattern has been exaggerated in Rhode Island where the proportions of tuberculosis cases among blacks, Hispanics and particularly Asians are greater than that seen in the United States overall for these groups. Locally, cases of tuberculosis among blacks increased from 5 cases in 1985 to 19 cases in 1990 (a 280% increase) compared to a 27% increase nationally. Hispanics with tuberculosis in Rhode Island increased from 2 cases in 1986 to 9 cases in 1990 (a 350% increase) compared to a 54% increase for the United States for the same period.

The greatest increase in tuberculosis incidence rates in Rhode Island, however, has occurred among Asians. Rhode Island has the highest proportion of Southeast Asian residents based on total population and the greatest percentage increase in Southeast Asians of all 50 states. According to the 1990 census there are 18,325 Asians living in Rhode Island and although a further description of ethnicity is not given, it is estimated that the majority are Southeast Asians. Between 1985 and 1990 the number of Asians with tuberculosis in Rhode Island increased by 367% from 3 to 14 cases. This increase is nearly 20 times that seen nationally (19.6%) for the same period. The high risk for active tuberculosis in this group is heralded by their high rate of tuberculin skin test positivity. Of all newly arriving Southeast Asian refugees screened at the Providence Ambulatory Health Care Facility, 41% had positive tuberculin skin tests, according to data from the Refugee Health Screening Program for July to December 1990.

The disproportionate number of tuberculosis cases in all these minority groups underscores their greater risk for developing active disease. In Rhode Island, only 10.3% of the population are Hispanic, black or Asian, but 47.4% of the 401 tuberculosis cases reported between 1985 and 1991 were from these groups (Figure 1). Hispanics comprise 4.6% of the total population, blacks 3.9% and Asians 1.8%. Asians, despite being the smallest of these three groups, had the highest proportion of tuberculosis cases with 20.2%, followed by blacks with 15.5% and Hispanics with 11.7%.

Birth Origin

All states began reporting the country of origin for tuberculosis cases in

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1986. Foreign-born persons accounted for 21.6% of cases reported in 1986 and 24.4% of those in 1990 in the United States as a whole. In Rhode Island, the foreign-born tuberculosis cases rose from 36% in 1985 to 58% in 1991. Thus, between 1986 and 1990, Rhode Island experienced an 80% increase in the proportion of tuberculosis cases who were foreign-born; this is three times the national increase of 27% for the same period.

State Tuberculosis Control Program

Currently, a statewide control program administered by the Department of Health is responsible for managing the burgeoning tuberculosis problem here. The program has a two-part structure: surveillance and case investigation are conducted by staff at the Department of Health, while individual patients are seen in the Tuberculosis Clinic.

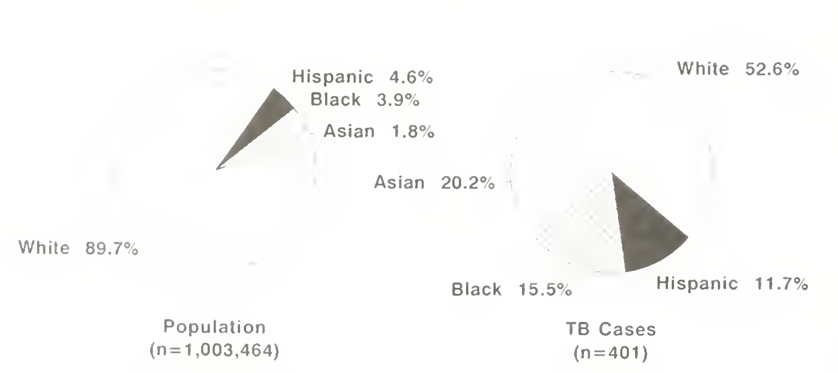
Until this year, the TB program staff located at the Department of Health offices in Providence consisted of only two nurses with modest clerical and computer support. Recently, however, the Centers for Disease Control awarded a Cooperative Agreement for Tuberculosis Prevention and Control/Elimination to the Department of Health. The agreement has provided a full-time tuberculosis program coordinator, a part-time public health epidemiologist and a bilingual outreach worker for directly observed therapy and case finding. Together they are responsible for active surveillance for tuberculosis, investigation and screening of all contacts and conducting public and professional education about tuberculosis.

In Rhode Island only 10.3% of the population are Hispanic, black or Asian, but 47.4% of the 401 tuberculosis cases reported between 1985 and 1991 were from these groups.

Individual patients are seen at the Tuberculosis Clinic located at the Roger Williams Medical Center. The current level of funding permits only four half-day sessions weekly. The patient load is such that routine prophylaxis cases must wait 6 months for an appointment because priority must be given to clinically active or high-risk patients.

A snapshot of the fast-changing patient load is that for the first 2 weeks of July 1991, 30 patients were scheduled for each half-day session on average. More recently the average number of patients scheduled per clinic session has increased to 50. The staffing plan is such that there is only one staff physician assigned per clinic session. At its present level of funding, the Tuberculosis Clinic has been unable to keep pace with the demand for its services, and that demand continues to rise.

Fig. 1 – Distribution of race/ethnic groups in the Rhode Island population, 1990 census, and in tuberculosis cases, 1985-1990



Summary

The increase in the reported cases of tuberculosis in Rhode Island from 1985 to 1991 has been striking. This rise has occurred at a faster rate than that for the United States overall. Although the HIV epidemic is largely to blame for the resurgence of tuberculosis nationwide, its impact on tuberculosis locally has been muted. The rise in reported cases in Rhode Island is attributable mainly to increased cases among minority groups, particularly Southeast Asians. Blacks and Hispanics are likewise at an increased risk for developing active disease. Especially alarming is the dramatic rise in the number of tuberculosis cases reported in children in Rhode Island, a reflection of active disease transmission in the community. The Rhode Island Tuberculosis Control Program, already functioning at full capacity, must find ways of curbing the growing tuberculosis problem.

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An Update on Tuberculosis in Children: The Rhode Island Experience

Bernadette A. Albanese, MD
Susan Mates, MD
Georges Peter, MD

Tuberculosis has increased in Rhode Island, especially among children.

One of the groups most affected by the increase in tuberculosis rates is children under 15-years-old. Between 1962 and 1987 childhood tuberculosis case rates nationally had declined about 6% per year, paralleling the rates found in the adult population. However in 1990, 1,596 cases were reported in children under 15, representing a notable 36% increase in comparison to 1987 and a 21% increase from 1989.[1] About 60% of these cases occurred in children under 5.

Similarly, Rhode Island children have been affected by the increase in tuberculosis rates (Figure 1). The total case rate per 100,000 population was 3.9 in 1988, 5.7 in 1989, and 7.1 in 1991.[2] In 1989 the 4 reported cases under 15 years of age represented 7% of the total, while the 11 cases in 1991 reflected 15% of the total. Almost 50% of these cases were among children under 5.

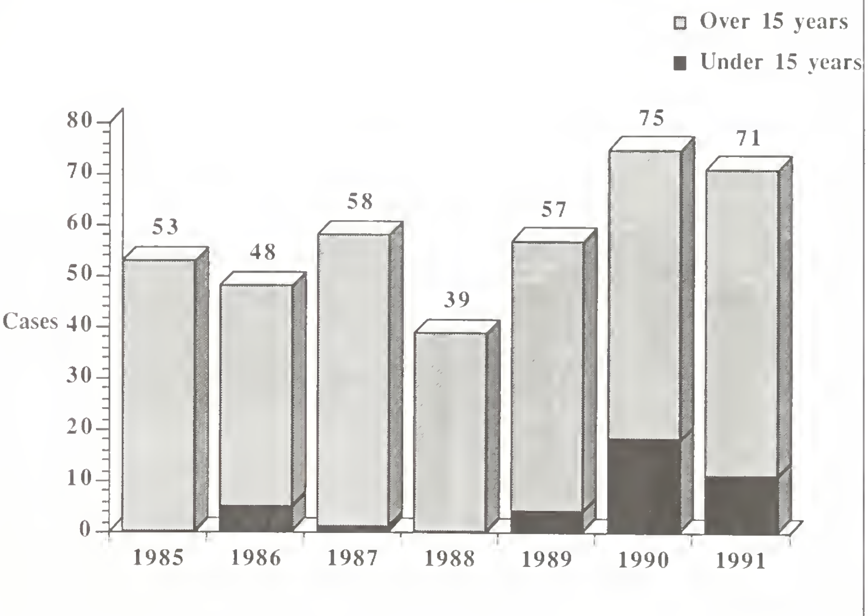
During 1990 in Rhode Island, 26% of the childhood cases of pulmonary tuberculosis occurred in non-Hispanic whites, 47% in blacks, and 27% in Asian/Pacific Islanders.[2] Nationwide, tuberculosis has increased disproportionately among Hispanics, non-Hispanic blacks, and Asian/Pacific Islanders. Among children, disease has clustered geographically, with seven states accounting for 63% of reported cases in children less than 5.[1] The majority of childhood cases occurs in racial and ethnic minority groups, children from impoverished homes, and those foreign-born or whose parents are immigrants from countries with a high prevalence of tuberculosis.[3]

Tuberculosis in children is significant not only for its personal health impact but also because it is evidence of transmission of infection among all age groups.[4] The majority of infected children acquire the organism from an adult with active, contagious tuberculosis. Later, as adults, they become the potential reservoirs from which future cases will develop. An increase in prevalence of pediatric tuberculosis reflects a failure to control adult disease. Public health authorities thus use the incidence of tuberculosis in children as a marker for the extent of tuberculosis in a given community and as a gauge of the need for control strategies.[1,4]

Finding Infected Children

Contact screening is the most efficient method for identifying children

Fig. 1 – **Rhode Island Tuberculosis Cases by Age 1985-1991**



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infected with tuberculosis. In 1985, Nolan reviewed cases of pediatric tuberculosis occurring over a 5-year period in several North Carolina counties to define the epidemiology of disease in this age group.[5] Contact screening of an adult with active disease detected 79 of the 99 cases (80%). Only 3 cases (3%) were detected after routine screening, and 17 cases (17%) were diagnosed after presentation to a physician with symptoms referable to tuberculosis.

Of the children with symptomatic presentation, history disclosed the source case in 60%. More than 85% of source cases in all groups were adult household contacts. All cases detected by routine screening and 77% of those identified by contact screening were asymptomatic. These results emphasize the importance of tuberculin skin testing of children in contact tracing to identify active cases of tuberculosis. All household contacts of a child with a positive tuberculin reaction should be examined with a skin test.[1]

Currently, the recommendations of the American Thoracic Society (ATS) and those of the American Academy of Pediatrics (AAP) on routine skin testing in children differ. The ATS, with concurrence of the Tuberculosis Division of the Centers for Disease Control (CDC), does not recommend routine tuberculin testing in populations with a low (less than 1%) prevalence of tuberculosis.[1,3] However, the AAP considers routine skin testing at three stages of childhood as a reasonable alternative to no testing in low-risk groups. These ages are: (1) 12 to 15 months; (2) before school entry (4 to 6 years of age); and (3) in adolescence (14 to 16 years of age).[3] For those children deemed at high risk for tuberculosis infection, the AAP, ATS, and the CDC recommend annual skin testing (Table 1).

Table 1.–**Children at High Risk for Tuberculosis Infection***

- Racial/Ethnic Groups
  - Black
  - Hispanic
  - Asian
  - American Indian
  - Alaskan Native
- Foreign-born persons from high prevalence countries
- Medically-underserved, low-income families
- Children residing in communities with a high case rate of tuberculosis

* Modified from *J Pediatr* 1992; 120:840.

Current indications for tuberculin skin testing of children recommended by the Rhode Island Department of Health are consistent with those of the CDC. In areas of the state with a low incidence of disease, indications for tuberculin screening are based on the likelihood of exposure in the child, such as travel or family history. In high incidence areas (ie, Providence County) skin testing every 1 to 2 years is recommended. Physicians should consider skin testing patients on admission to any hospital in Providence if this has not been done within the past year.

Tuberculin Skin Testing

The two techniques for tuberculin skin testing are the Mantoux test and multiple-puncture tests (MPTs). The standard test is the Mantoux test of 5 TU-PPD (0.1 ml). MPTs have been used primarily because of their ease of administration, but they have significant disadvantages. The dose of tuberculin introduced into the skin is not exact so reaction size cannot be standardized. Both false-positive and false-negative rates are higher for MPTs than those for the Mantoux test. Therefore, the Mantoux skin test is the preferred test for routine screening, for evaluating children who are known contacts of patients with tuberculosis, and for screening of children from high risk populations.[1,3] If a MPT is used, any positive reaction should be confirmed with a Mantoux test.

The interpretation of the Mantoux tuberculin skin test reaction has changed and the guidelines from the ATS and CDC have been revised.[1] For persons at high risk for tuberculosis (HIV infection, contacts of cases, clinical evidence of tuberculosis), a reaction of ≥ 5 mm is considered positive. In other high risk groups (foreign-born, indigent population), a reaction of ≥ 10 mm is a positive result. For low risk individuals, a reaction of ≥ 15 mm is considered positive. The AAP also bases its criteria on epidemiological factors, but considers any reaction ≥ 10 mm to be positive.[3] For patients who were BCG vaccine recipients, no reliable method is available for distinguishing tuberculin reactions due to vaccination with BCG from those caused by natural mycobacterial infection. Skin test reactivity from BCG vaccination generally diminishes with time and often does not give a reaction of more than 10 mm induration. In most cases, positive reactions of ≥ 10 mm in a BCG-vaccinated child probably indicates infection with *M. tuberculosis* and requires further diagnostic evaluation and possible chemotherapy.[1]

Diagnosis

While most persons infected with *M. tuberculosis* are asymptomatic at the time of first positive tuberculin reaction, tuberculous disease is likely to develop more rapidly following primary infection in younger children than in adults. Five percent to 10% of immunologically normal adults with untreated tuberculous infection will develop disease at some point during their lives. Yet among infected children less than 1 year of age who do not receive specific treatment, as many as 43% will have radiographic evidence of tuberculous disease. For children ages 1 to 5 years and adolescents aged 11 to 15 years, these figures are 24% and 15% respectively.[1]

> ***Tuberculosis in children is significant not only for its personal health impact but also because it is evidence of transmission of infection among all age groups.***

In tuberculous disease the most common sites of involvement are the lungs and lymph nodes. A chest X-ray can reveal hilar lymph node enlargement with or without parenchymal involvement, but most children demonstrating pulmonary disease are clinically asymptomatic. Unlike pulmonary disease, extrapulmonary involvement is usually diagnosed after symptoms have developed. Lymphadenopathy most commonly occurs in hilar, mediastinal, cervical, or supraclavicular nodes. Tuberculous cervical adenitis must be distinguished from nontuberculous mycobacterial infection, based on epidemiological history, chest X-ray, and excisional biopsy with culture, if necessary. Tuberculous meningitis and miliary disease develop from lymphohematogenous spread of tubercle bacilli. These diseases are much less common, but have a particular predilection for infants and younger children. Nonspecific symptoms of fever, failure to thrive, or developmental delay that slowly progress can be the initial manifestations. A chest X-ray and skin test aid in the diagnosis of tuberculosis in these patients.

Diagnosis of tuberculosis in children requires a detailed history of exposures and identification of any high risk characteristics for tuberculosis infection and underlying medical problems that increase the risk for progression to active disease among infected persons. These include persons with immunodeficiency, HIV infection, Hodgkin's disease, lymphoma, diabetes mellitus, malnutrition, and those on immunosuppressive drugs.[3] Positive tuberculin testing mandates identification of the source case and attempts to recover the organism for drug susceptibility testing. The latter is a major consideration in the choice of chemotherapeutic regimens, particularly in view of the increasing incidence of drug resistance. A chest X-ray will determine whether pulmonic involvement is present. Cultures of gastric washings, sputum, pleural fluid, cerebrospinal fluid, urine, or other body fluids generally have low yield in children, but nevertheless should be sought in all cases of disease.[3] Confirmation of cases and identification of drug resistance is important not only for the specific patient, but also for control of tuberculosis in the community.

Treatment

Recent clinical trials of tuberculosis therapy in children and specific recommendations are available.[6,7] Briefly, current treatment of children with asymptomatic tuberculous infection entails a single drug regimen (isoniazid or rifampin depending on drug resistance) for 9 months. Pulmonary and extrapulmonary disease (except meningeal, miliary, bone/joint disease) is usually treated with a 6-month regimen with isoniazid, rifam-

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pin, and pyrazinamide. For therapy of other forms of extrapulmonary disease, patients coinfected with HIV, pregnant women, or patients infected with drug resistant organisms, consultation with an expert in tuberculosis is recommended.

Conclusion

Tuberculosis in children continues to be an important health problem nationally and in our state. Although infection in children tends to occur in clusters of high risk individuals, such as the indigent population, the foreign-born, Hispanics, and blacks, it represents a societal public health problem with significant implications for adults. Childhood tuberculosis can be used to assess the efficacy of tuberculosis control strategies, surveillance methods, and drug therapies. The increasing incidence of tuberculosis indicates the need for more effective screening and treatment programs for both children and adults.

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Drug-resistant Tuberculosis

Robin E. Huebner, PhD, MPH

The majority of cases have occurred in persons known to be co-infected with the human immunodeficiency virus (HIV) and the mortality rates have been high (59% to 89%).

Since 1990, the Centers for Disease Control (CDC) has investigated eight outbreaks of multidrug-resistant (MDR) tuberculosis (TB) in both hospital and correctional institution settings in New York and Florida.[1-3] All of these outbreaks have been characterized by the transmission of strains of *Mycobacterium tuberculosis* resistant to at least isoniazid and rifampin, with some strains showing additional resistance to other drugs, such as ethambutol, streptomycin, ethionamide, kanamycin, and rifabutin. To date, the number of MDR TB cases in these outbreaks totals more than 200. The majority of cases have occurred in persons known to be co-infected with the human immunodeficiency virus (HIV) and the mortality rates have been high (59% to 89%). Transmission of drug-resistant organisms to health care workers and correctional employees also has been documented through tuberculin skin test surveillance.

While outbreaks of MDR TB have remained geographically localized to New York and Florida, evidence is accumulating that indicates drug resistance may be increasing nationwide. According to preliminary data reported to CDC during the first quarter of 1991, 8.1% of new cases of TB are resistant to isoniazid (INH) (CDC unpublished data); in a survey conducted from 1982 through 1986 only 5.3% of isolates from new cases were found to be resistant to INH.[4] In 1991, 13 states reported at least one case of TB with organisms resistant to both INH and rifampin.

Drug resistance poses a serious threat to the control of TB in the United States. The loss of susceptibility to INH and rifampin, the two most effective antituberculosis drugs available, means relying on other, more toxic and less effective treatment regimens. Such regimens not only are less successful in effecting a cure but can add significant costs to already financially strained TB control programs. It is estimated that the cost of treating MDR TB can be 10 to 15 times that needed to manage drug-susceptible disease. In addition, the prophylactic treatment of contacts of MDR TB cases is complicated by the lack of data regarding the efficacy of alternative preventive therapy regimens for drug-resistant organisms.

How does drug resistance occur? In bacterial populations, drug resistance arises through spontaneous genetic mutations occurring once in every 10^5 to 10^8 cell divisions. In small populations of *M. tuberculosis* these resistant organisms represent a minor proportion of the total number of bacilli; however, the significance of drug-resistant mutants increases as the size of the bacterial population increases. For example, the number of organisms in persons infected with *M. tuberculosis* without active disease is small, so few, if any, of the bacilli will be drug resistant. In this case, preventive therapy for TB can be accomplished through single drug therapy, most commonly with INH. In contrast, the progression from latent infection to active disease signals a significant increase in the bacterial burden, increasing the likelihood that some bacilli will be drug-resistant. Current American Thoracic Society (ATS)/CDC guidelines call for treatment of TB with at least three antituberculosis drugs. In the face of growing drug resistance, the CDC is preparing recommendations for the use of a four-drug initial treatment regimen while awaiting drug susceptibility results.

The balance between drug-susceptible and drug-resistant organisms can be influenced by factors that allow the development and unrestricted multiplication of drug-resistant mutants. If a single drug is used to treat active TB, an initially small population of organisms resistant to that drug may be able to proliferate and eventually become the dominant population. When the number of organisms resistant to a given drug exceeds 1% of the total bacterial population, that drug may no longer be useful for antituberculosis treatment. Thus, small numbers of initially resistant organisms can be selected through ineffective drug therapy, including the use of too few drugs or inappropriate doses of one or more drugs. This "secondary" or acquired resistance is probably the most significant cause of drug-resistant TB in the United States. Costello et al[5] found resistance rates in TB patients who had previously received therapy with a single drug to be 1.8 times higher than that seen in patients given multiple drug therapy.

Nonadherence with treatment con-

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tinues to be a major obstacle to the successful control of TB. A recent study found that 89% of TB patients in one New York City hospital failed to complete treatment, with the majority lost to follow-up within 3 months of diagnosis.[6] Such erratic use of antituberculosis chemotherapy can result in drug-resistant disease. A history of prior TB treatment has been shown in several studies to be associated with the presence of drug-resistant organisms.[5,7] In the 1991 survey, 22% of isolates from previously treated patients were found to be resistant to INH (CDC unpublished data).

Nonadherence with treatment not only results in the inability to cure the individual patient but in prolonged infectiousness and the potential spread of drug resistant organisms to other susceptible individuals. The multidrug-resistant outbreaks described earlier are examples of "primary resistance" in which the initial infecting organisms are drug-resistant. Delays in the recognition of drug resistance meant ineffective chemotherapy, resulting in continued transmission of tubercle bacilli between patients and health care staff, and high case fatality rates.

What measures can be taken to prevent and control drug-resistant TB? An essential component of controlling the spread of both drug-susceptible and drug-resistant TB is the early diagnosis of patients with active disease. Health care staff should maintain a high clinical index of suspicion for TB, particularly among patients from high-risk populations. These include low-income, medically-underserved populations, immigrants from countries with a high prevalence of TB, residents of long-term care and correctional facilities, close contacts of infectious TB cases and recent tuberculin skin test converters. Individuals infected with HIV also are at very high risk for TB and should be part of all case surveillance, keeping in mind that TB can occur simultaneously with other pulmonary pathogens such as *Pneumocystis carinii* and *M. avium* complex.

The absence of *in vitro* drug susceptibility results makes the selection of an initial treatment regimen problematic. Drug susceptibility testing should be performed on initial isolates from all patients to confirm the potential effectiveness of chemotherapy. Susceptibility testing should be repeated if the patient continues to produce culture-positive sputum after 3 months of treatment. Monitoring local trends in drug resistance patterns can help to either identify areas where interventions may be successful in preventing MDR TB outbreaks or to assess the control of already established drug resistance. Drug resistance should be considered in all patients living in areas where such resistance is prevalent and in persons with a history of non-adherence with tuberculosis treatment. Foreign-born individuals also have been found to be twice as likely to have either primary or acquired resistance as US-born patients.[4] At the time this article was written, CDC guidelines recommended that, in cases where drug resistance is suspected, additional drugs may need to be added to the treatment regimen based on the suspected drug susceptibility pattern. However, it is anticipated that new guidelines will be released shortly that recommend beginning all patients on a four-drug regimen, INH, rifampin, pyrazinamide, and either streptomycin or ethambutol. This regimen could then be modified, as appropriate, when drug susceptibility test results are available.

The loss of susceptibility to INH and rifampin, the two most effective antituberculosis drugs available, means relying on other, more toxic and less effective treatment regimens.

The successful completion of treatment is key to controlling drug-resistant TB in the United States. Adherence with therapy may be improved with a variety of incentives and enablers. The most effective means of ensuring adherence with therapy is the use of directly observed therapy (DOT), with a health care worker or other responsible individual present to confirm that the medications are being taken. The previously mentioned CDC recommendations also will emphasize that all TB patients be placed on DOT, unless adherence can be otherwise ensured. Patient adherence with treatment should be of concern to all health care providers and efforts taken to minimize the number of patients lost to follow up.

Finally, stimulating the awareness of the medical community and the public to the increasing incidence of TB in the United States and the growing problem of drug resistance can aid in the control of this public health threat.

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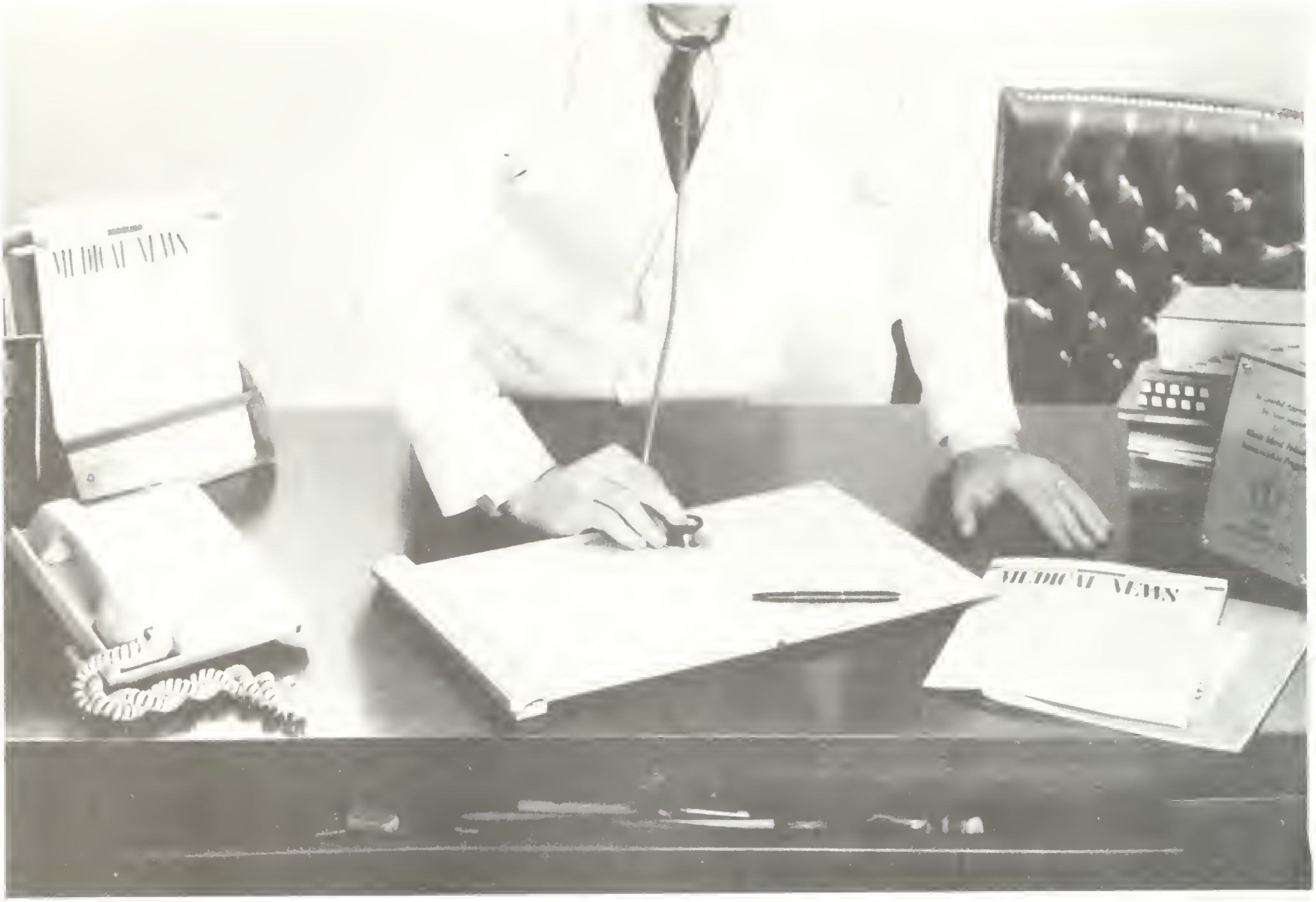

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The Essentials of a Tuberculosis Elimination Program

E. Jane Carter, MD

Active tuberculosis cases arise from primary progressive infection in newly infected individuals (recent reactors) and from reactivation due to immune breakdown in those with latent infection from a remote exposure in the past.

The US Department of Health and Human Services and the Centers for Disease Control have established a program to eliminate tuberculosis in the United States by the year 2010. (Elimination is defined as a case rate of less than one per 100,000 population. It differs from eradication, which signifies no further disease occurrence.)

Elimination is achievable for several reasons. Tuberculosis rates are highest in definable geographic and demographic population pockets, enabling resources to be directed efficiently. Improvements in biotechnology have resulted in better diagnostic, treatment and preventive strategies. Widespread access to computer and telecommunications equipment can facilitate the adoption of these new procedures and ideas into clinical and public health policy.

The key to successful implementation of a tuberculosis control program is understanding the derivation of new cases (Figure 1). Active tuberculosis cases arise from primary progressive infection in newly infected individuals (recent reactors) and from reactivation due to immune breakdown in those with latent infection from a remote exposure in the past. Although the rate at which recent reactors progress to active disease is higher than that at which latent infection breaks down to active disease, the majority of active cases arise from latent infection because the pool of remote reactors is so much larger. Therefore, although identification and early treatment of active cases is necessary to interrupt transmission, a control program can never truly succeed without strong emphasis on the identification and treatment of tuberculin reactors.

E. Jane Carter, MD, is clinical assistant professor of Medicine, Division of Pulmonary Diseases, Brown University School of Medicine and staff physician, Tuberculosis Clinic, Roger Williams Medical Center.

Why has there been a recent increase in tuberculosis? Because as case rates fell, complacency developed and compliance was not enforced, because indifference set in as the disease retreated into particular enclaves, and because resources were shifted away from tuberculosis.

Prophylactic therapy of the large pool of persons with latent infection prevents progression to active disease, development of contagion and further transmission. In a penultimate disease control program, transmission stops, case rates decline to zero and eventually, the disease is eradicated.

In 1992, highly effective control and prevention guidelines already exist. Why, then, has there been a recent increase in tuberculosis? Because as case rates fell, complacency developed and compliance was not enforced, because indifference set in as the disease retreated into particular enclaves, and because resources were shifted away from tuberculosis. HIV infection only served to accelerate the eventual return of tuberculosis.

Despite these past mistakes, we remain capable of bringing the disease back under control by the systematic and pain-staking application of public health methods that worked for more than 30 years. Tuberculosis control efforts, both past and present, rest on the triad of treating active cases, screening contacts, and prophylaxis of latent infection.

The key to control of active disease is compliance with therapy. Compliance may be improved through a variety of means such as use of directly observed therapy (DOT) in either the clinic setting or by outreach workers, use of twice weekly dosage schedules when appropriate, or free access to medications and medical care. Enablers and incentives tailored to the specific situation can vary from coffee in the waiting room to access to social services for housing and employment at the clinic site. Compliance can be insured when all barriers to effective treatment are eliminated.

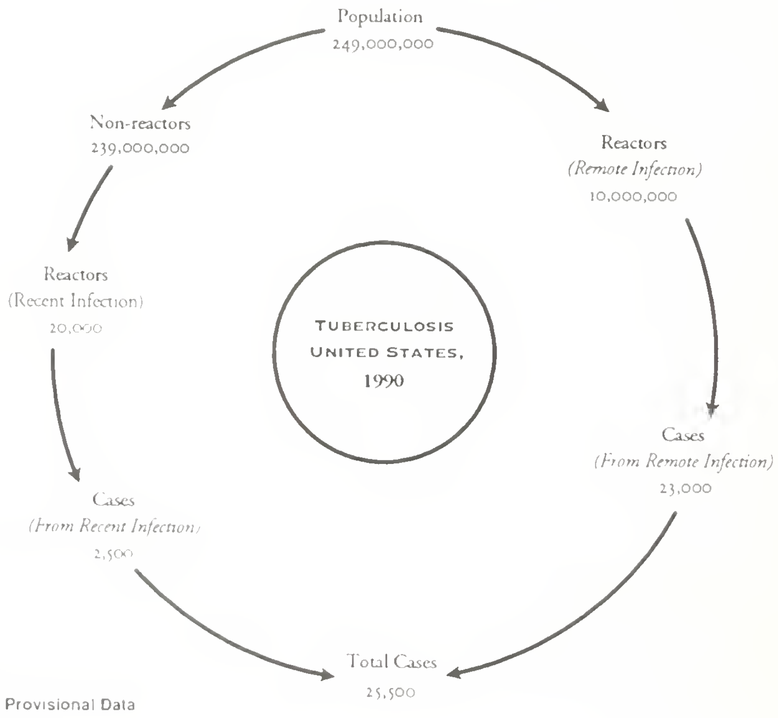
Screening of contacts is predicated on knowing that an active case exists, and hence health departments must insure that they are notified within 3 days of the diagnosis of active tuberculous disease. Rapid notification aids in early identification and screening of contacts. Contact tracing not only involves the household members of the index case but also the "community" of the index case, ie, coworkers, schoolmates, hospital or nursing home roommates, fellow prisoners, etc. To identify these circles of contact, cooperation between the health department, the medical community and the public is necessary. General education efforts are crucial to remove both the stigma and the fear still surrounding tuberculosis.

Prophylaxis of latent infection is what will make the strongest contribution to the long-term goal of tuberculosis elimination. More widespread application of existing screening methods, ie, tuberculin skin testing, will identify the large pool of individuals with latent infection. Although the goal stated by the Department of Health and Human Services is that all US residents have one tuberculin skin test result on record, certain demographic or geographic groups exist in which screening will produce a high yield. Those populations with high rates of skin test positivity are those at highest risk to develop disease.

Because the characteristics of the high-risk population may vary from region to region, local health departments must identify their locale's high risk populations and develop strategies to target them. For example, the homeless may be reached through mobile screening programs that travel to shelters and soup kitchens. HIV-infected individuals may be tuberculin tested through methadone maintenance or drug rehabilitation programs or through STD clinics. Particular demographic and ethnic groups may be accessed through their community-based organizations. Flexibility and ingenuity by health care organizations combined with community education are necessary ingredients for success.

The tools to do the job are waiting to be used. We know them to be effective. Systematic implementation of proven low tech public health methods with a 1990s twist (directly observed therapy, all-out efforts to ensure compliance, large-scale screening and prophylaxis) can result in the elimination of tuberculosis. Success will depend upon the cooperation of the medical community, public health department, political establishments, and the general community. The mistakes of the past either can continue to haunt us or to galvanize us to action. The time to decide is now.

Fig. 1 – **Epidemiology of Tuberculosis and Tuberculous Infection, United States, 1990**



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Screening for Tuberculosis: Everything You Already Knew, Probably Forgot and Meant to Look Up

Marguerite A. Neill, MD
Susan Mates, MD

Screening efforts should be focused on those population subgroups which are known to have either high rates of active tuberculosis or a rapid rate of progression to active disease once infection has occurred.

The resurgence of tuberculosis has become a hot topic, receiving intense media attention and coverage in both the medical and lay press. Questions to physicians about tuberculosis are coming from many quarters, necessitating the recall of basic information about the disease, which they may not have reviewed for some time. Many of the questions relate to tuberculin testing, a simple test in performance but seemingly confusing in interpretation and significance. A lack of time or just a plain lack of energy at the end of a busy day often seems to preclude the best of intentions to "look up that stuff about skin testing."

Following are some of the most common questions asked about tuberculin testing. The answers are by no means inclusive, but we hope they can prompt at least a few memory neurons to fire as well as provide a basic summary of the salient points to remember on skin testing.

1. Why screen for tuberculosis?

A hallmark of infection with *Mycobacterium tuberculosis* is a phase of, for practical purposes, dormancy in which the mycobacteria are present in the host but do not cause clinically apparent disease. This state was previously referred to as "tuberculous infection" but it is better viewed conceptually as being "latent tuberculosis" since this term correctly implies the organism's hidden status and potential for later overt disease.

Persons with latent tuberculosis often (but not always) can be identified by a positive skin test, generated by the recognition of intradermally injected mycobacterial antigens by their sensitized lymphocytes. Such persons can be prevented from subsequently developing active disease by receiving chemoprophylaxis. Screening for tuberculosis usually is not performed for its own sake but should be coupled to decisions on the necessity for prophylaxis. The ultimate purpose of screening with chemoprophylaxis is to eliminate tuberculosis in the population, by preventing reactivation disease in an individual and the secondary cases that would have resulted from transmission from them.

2. How do you screen for TB?

Most screening programs rely on skin testing. It is best performed by the Mantoux technique which is the intradermal injection of 0.1 ml of a tuberculin preparation. The tuberculin used most commonly today is purified-protein derivative (PPD) which is obtained from precipitated filtrates of heat-killed cultures of tubercle bacilli that have been grown in a synthetic medium. Only the 5 TU (intermediate) dosage has been standardized for PPD testing. Multiple puncture devices are not optimal because of variability in the amount of antigen they deliver.

3. Who should be screened?

Screening the general population is not cost-effective because all persons are not at equal risk for exposure to tuberculosis. Screening efforts should be focused on those population subgroups that are known to have either high rates of active tuberculosis or a rapid rate of progression to active disease once infection has occurred. The success of targeted screening coupled with appropriate preventive therapy is reflected in a continually declining annual incidence of disease.

Since 1984, however, there has been an alarming rise in annual cases of tuberculosis in the United States and the failure of screening programs has contributed to this rise. To reverse this trend, it will be of paramount importance for physicians to recognize those patients who should be screened (Table 1).

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Table 1 – **Groups to Screen with a Tuberculin Skin Test**

- Persons with HIV infection
- Close contacts of infectious tuberculosis cases
- Persons with medical conditions which increase the risk of tuberculosis
- Foreign-born persons from high prevalence countries
- Low-income populations, including high-risk minorities
- Alcoholics and intravenous drug users
- Residents of long-term care facilities (including prisons)
- Populations identified locally as being at increased risk for tuberculosis, eg, health care workers in some areas.

Medical conditions that can dramatically increase the risk of developing active tuberculosis once infection has occurred include all forms of immunosuppressive therapy, prolonged steroid therapy, silicosis, diabetes mellitus, hematologic and reticuloendothelial diseases, end-stage renal disease, intestinal bypass and postgastrectomy states, and being 10% or more below ideal body weight. Surpassing all these conditions, however, is co-infection with the human immunodeficiency virus. HIV is the most potent risk factor yet recognized in permitting latent infection with tuberculosis to progress more often and more rapidly to clinically active tuberculosis.

4. How do I read the skin test?

The Mantoux skin test is read 48 hours after intradermal injection. Erythema does not influence the PPD interpretation. Palpable induration is the *only* parameter that should be measured. The diameter of induration should be measured transversely to the long axis of the forearm and recorded in millimeters, not simply as positive or negative. Occasionally patients will have vesiculation at the injection site, and this is recorded as a positive reaction. The criteria for determining whether a skin test result qualifies as being positive varies with certain patient groups (Table 2).

5. Should I include other skin test antigens with the tuberculin test?

The purpose of other skin test antigens is to detect anergy, ie, the complete lack of reactivity to all antigens, not just tuberculin. The inclusion of additional skin test antigens with the tuberculin test is very important in the evaluation of individual patients with particular conditions known to be associated with high rates of anergy, (eg, sarcoidosis, steroid therapy, and Hodgkin's disease). The decision to use additional antigens in screening a population is usually based on an assessment of what the background rate of anergy is in the entire population. School children, health care workers, and recent immigrants who are otherwise healthy should be screened with tuberculin alone.

6. Does a negative tuberculin skin test rule out tuberculosis?

Absolutely not. There are many potential causes of a false negative tuberculin skin test, some of which may relate to the person being tested, and others being factors relating to the tuberculin or the method of administration. Recent viral infections (chicken pox), live virus vaccinations (measles, mumps, polio), severe malnutrition, the extremes of age or overwhelming infection with *M. tuberculosis* are examples of factors that may cause the skin test to be falsely negative. Improper dilution of the tuberculin, exposure to prolonged light and heat, injection of too little antigen or injection too deep are examples of factors related to the method of administration which can result in a falsely negative test. An important axiom of tuberculin skin testing is that the PPD neither establishes nor negates a diagnosis of tuberculosis.

7. What do I do with a patient who has a positive PPD?

Evaluation of a person with a positive PPD should focus on distinguishing whether there is active vs latent tuberculous infection. It should not be assumed that those with positive skin tests are necessarily those with latent infection since 70% of patients with active tuberculosis have positive skin tests. The history and physical examination should determine whether there

Table 2 – **Criteria for a Positive PPD Test**

Reaction size (mm duration)	**Considered Positive in These Circumstances**
≥ 5mm	• Recent contact of an active tuberculosis case • HIV infected persons • Chest X-ray with fibrotic changes suggestive of healed tuberculosis
≥ 10 mm	• Foreign-born persons from high prevalence countries in Asia, Africa and Latin America • Intravenous drug users • Indigent and medically underserved populations • Residents of long-term care facilities • Persons with conditions which increase the risk of developing active tuberculosis following infection • Health care workers serving the above populations
≥ 15 mm	• All other persons

are fever, weight loss, lymphadenopathy, cough, sputum production, hemoptysis or joint effusions. A chest X-ray should be performed to detect any radiographic changes of active tuberculosis. An asymptomatic person with a positive skin test and no radiographic changes consistent with active tuberculosis can then generally be considered as having latent infection.

Complicating this, however, is the fact that exposure to other mycobacteria can result in sensitization to antigens that are cross-reactive with those present in the PPD preparation so that the skin test might be falsely positive. One way around this problem of specificity is to define the cut-off values for skin test positivity such that the criteria minimize the false positive rate. Although it is true that not every positive tuberculin skin test represents true tuberculous infection, the skin test criteria for positivity have been selected to maximize the detection of true positives and minimize the false negatives. Cross reactions due to soil mycobacteria are uncommon in Rhode Island and the Northeast, whereas these reactions are common in the southeastern United States.

Recent viral infections, live virus vaccinations, severe malnutrition, the extremes of age or overwhelming infection with M. tuberculosis are examples of factors that may cause the skin test to be falsely negative.

8. Does everyone with a positive PPD deserve isoniazid prophylaxis?

The decision to prescribe INH prophylaxis is a balance between the benefits to the patient in preventing the development of active infection from reactivation vs the risks associated with adverse reactions to the drug. The greater the risk for the development of active disease (as in those patients with medical risk factors which increase the likelihood of developing active tuberculosis), the more medically compelling is the option to treat prophylactically. Counterbalancing this is the potential risk for adverse reactions to INH, which include hepatitis and peripheral neuritis. These adverse reactions can be minimized by correct prescribing, close monitoring of the patient, and avoidance of alcohol. Those categories warranting preventive therapy are shown in Table 3.

Table 3 – **Candidates for Preventive Therapy***

I. Skin-test positive persons in the following high-risk groups *regardless of age*
- Persons with known or suspected HIV infection (PPD ≥ 5mm)*
- Close contacts of infectious tuberculosis cases (PPD ≥ 5mm)
- Previously untreated or inadequately treated persons with abnormal chest radiographs (PPD ≥ 5mm)
- Recent skin test converters (criteria depend on age and individual circumstance)
- Intravenous drug users (PPD ≥ 10mm if HIV seronegative)
- Persons with medical conditions which increase the risk of tuberculosis (PPD ≥ 10mm)

II. Skin-test positive persons in the following high-risk groups who are *less than 35 years of age:*
- Foreign-born persons from high prevalence countries (PPD ≥ 10mm)
- Low-income populations, including high-risk minorities (PPD ≥ 10mm)
- Residents of long-term care facilities (including prisons) (PPD ≥ 10mm)
- Personnel working with persons in high-risk categories (PPD ≥ 10mm)

III. Skin-test positive persons who are less than 35 years of age in low-risk groups (PPD ≥ 15mm)

* Criteria for a positive test (mm induration) is given in parentheses.

INH prophylaxis is an extremely effective therapy. Twelve months of daily INH can reduce the risk of developing active tuberculosis in more than 90% of patients who complete the regimen; 6 months of preventive therapy with INH alone is also effective (approximately 70%). Twelve months should be prescribed for persons with abnormal chest radiographs consistent with old tuberculosis and for persons coinfected with HIV. The usual adult dose of INH is 5 mg/kg/day, maximum 300 mg daily for 6 months; the cost of this regimen is approximately $10.

9. How should I follow a patient on prophylaxis?

While asymptomatic transaminase elevation is very common with INH therapy, hepatitis is the most serious adverse reaction, and it can be fatal. This complication occurs more commonly in patients with preexisting liver disease, older patients and those who consume alcohol on a daily basis. A general rule is to monitor the patient clinically every month during INH therapy. A baseline SGOT (ALT) should be drawn and then repeated every 4 weeks for the first 2 months. Any transaminase elevation accompanied by symptoms of hepatitis (jaundice, vomiting, nausea, anorexia) or an elevation of the transaminases to more than 3 to 5 times the upper limit of the normal range should warrant stopping INH. Whether to restart INH is usually based on individual considerations in the particular patient.

10. Does a history of prior BCG vaccination mean that a tuberculin skin test shouldn't be done?

The short answer to this is no. Skin test conversion rates after BCG vaccination have been highly variable and often much lower than 100% due to the age at vaccination and variations in BCG preparations. The mean reaction size in vaccinees is smaller than 10 mm and skin test positivity after BCG wanes considerably over time. There is no reliable method to distinguish those tuberculin reactions caused by natural infection from those caused by prior BCG administration. BCG vaccination is not considered 100% protective (in one large study it had no protective value) even in the face of a subsequent exposure and the vaccinee may still need INH prophylaxis. Thus, a health aide in a nursing home who has a history of BCG vaccination more than 10 years ago but who now has a 16 mm positive tuberculin test should be considered to have *M. tuberculosis* infection. The skin test reaction size is too large to be due to remote BCG vaccination. Given the potential for occupational exposure to tuberculosis, the individual should be considered to have a true positive tuberculin test on the basis of natural infection (not vaccination) and considered for INH prophylaxis if medical evaluation shows no evidence of active tuberculosis.

11. Does repeated skin testing cause a positive tuberculin test?

Repeated skin testing of uninfected persons does not sensitize them to tuberculin.

12. How soon after an exposure will the skin test become positive?

Following an exposure in which transmission of *M. tuberculosis* occurred, the skin test may become positive between 2 to 10 weeks later. Because of the potential for occupational exposure, health care workers generally should be screened yearly and should know their baseline PPD status. Following a known exposure to an active case of TB, they can be skin-tested approximately 2 to 3 months later to determine if skin test conversion has occurred, signifying transmission from the active case. A person with only a positive skin test and no evidence of active tuberculosis is not considered infectious. Those with a recent skin test conversion (ie, within the preceding 2 years) are at high risk of progression to active disease and are a target group for INH prophylaxis, regardless of age or other considerations.

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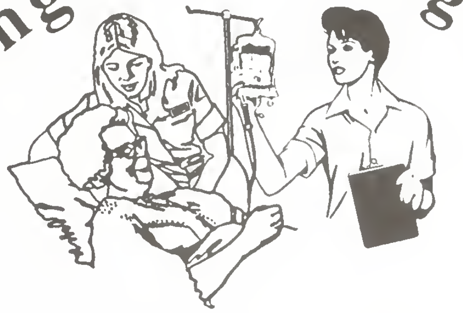

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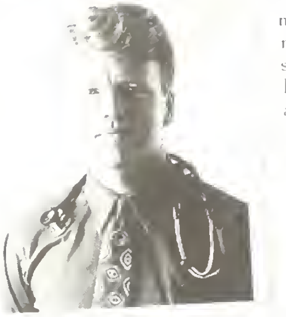

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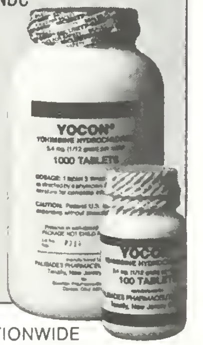

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The Diagnosis and Treatment of Active Tuberculosis

Susan Mates, MD
Marguerite A. Neill, MD

> *The single most important variable in successful treatment is compliance with taking the medication.*

The fate of a disease that is easily treated with effective drugs, that occurs in predictable segments of the population, and that is readily controlled by standard public health measures is usually predictable: Its incidence declines. It is no longer high on a list of differential diagnoses and its clinical details become fuzzy. Such has been the case with tuberculosis, a disease in decline in the United States until 1984 when it stubbornly came back. To understand why it has returned, it is necessary to review the pathophysiology of tuberculosis with an eye to avoiding the pitfalls that have allowed its recrudescence.

History

As early as 1500 BC, written records in Sanskrit described the disease tuberculosis. Hippocrates in 400 BC recommended rest, diet, altitude and thoracentesis as treatment and these recommendations did not vary greatly until the major tuberculosis drugs were discovered in this century. Although Aristotle observed in 350 BC the contagious nature of tuberculosis, it was not until 1882 that *Mycobacterium tuberculosis* was isolated by Robert Koch. Tuberculosis occurred in epidemic waves, peaking in England in 1750, Western Europe in 1800, the United States in 1900, and in developing countries the peak has probably not yet occurred. At the height of an epidemic, tuberculosis accounts for one-third of adult deaths and kills without respect to social class.

Microbiology

M. tuberculosis is endowed with characteristics, likely selected in a Darwinian fashion, that influence diagnosis and treatment. Most notable is its lipid-rich cell wall, which forms a waxy "capsule" and which accounts for its acid-fast character. The stain carbol fuchsin combines with mycolic acid in the cell wall to form a stable complex, which cannot be washed out with acid alcohol. This is the basis of the Ziehl-Neelsen stain by which the organisms are visualized on smear as acid-fast.

Other distinctive features of *M. tuberculosis* are its slow growth and 24-hour doubling time (compared with 20 minutes for *E. coli*). The ease with which *M. tuberculosis* becomes dormant in part accounts for the very long time that can elapse between inhalation of the organism and the presence of disease in an individual. This slow growth and long doubling time make it difficult to find effective antibiotics and probably also accounts for the difficulty in culturing *M. tuberculosis.*

Pathophysiology

With few exceptions, tuberculosis is transmitted by the respiratory route.[1] By coughing, sneezing or talking, a patient with pulmonary tuberculosis expels droplet nuclei, 10 microns in diameter, some of which contain viable *M. tuberculosis*. Persons in the immediate vicinity of the patient inhale these infected droplet nuclei. The infectiousness of the source case (which correlates roughly with the number of acid-fast bacilli on the sputum smear), and the propensity of the source to cough are determinants of transmission to contacts. Another is the closeness of contact. Thus the scenario for the most effective transmission is an adult with cavitary pulmonary disease and highly positive sputum smear who spends long hours in close contact with a child. Children are particularly susceptible to becoming infected if exposed. In the United States 27% of all household contacts of active pulmonary cases are infected but the figure is nearly double (50%) for pediatric household contacts. Children in general do not transmit the disease, because they neither have the organism load of an adult nor do they cough with the force required to transmit disease.

Once inhaled, the tubercle bacilli land randomly in the mid or lower lung fields. They are then taken up by macrophages and disseminated to the hilar or mediastinal lymph nodes (Figure 1). In most people the mycobacteria are not killed by the macrophage but multiply intracellularly. *M. tuberculosis* travels the lymphatics

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to enter the bloodstream by the thoracic duct from whence dissemination occurs throughout the body. Because of a predilection for areas of high oxygen tension, *M. tuberculosis* preferentially seeds the kidney, the apical posterior segment of the lung, and the epiphyseal areas of the long bones. Other less frequent but still common areas of involvement are the central nervous system, vertebrae, liver and spleen. After 6 to 14 weeks, in most persons, the development of cell-mediated immunity now halts the spread and multiplication of the bacilli, and the skin test becomes positive. This initial containment of the mycobacteria in granulomata can sometimes be seen on the chest X-ray as a Ghon complex, which is a calcified area in the lung at the site of the initial mycobacterial infection combined with a calcified hilar or mediastinal node. Most patients who have contained the disease, however, have no findings on X-ray.

Clinical Features

Approximately 95% of people who become infected contain the organism initially and do not become ill in the first two years. The remaining 5% do not contain the organism and develop various primary forms of disease. Progressive primary infection occurs most commonly in small children, the elderly and persons with compromised immunity, and the clinical features are dependent on the age of the patient, and the degree of immune dysfunction. Neonates and infants up to 6 months of age, patients with advanced AIDS, and other hosts with severely compromised cell-mediated immunity may develop a fulminant form of miliary tuberculosis within days or weeks after exposure. Examples of such clinical situations include parents with undiagnosed active tuberculosis who have newborn children in the household, AIDS patients with active tuberculosis who are hospitalized on AIDS wards where they can unwittingly expose other AIDS patients, and cases in nursing home residents who can expose other elderly, debilitated patients.

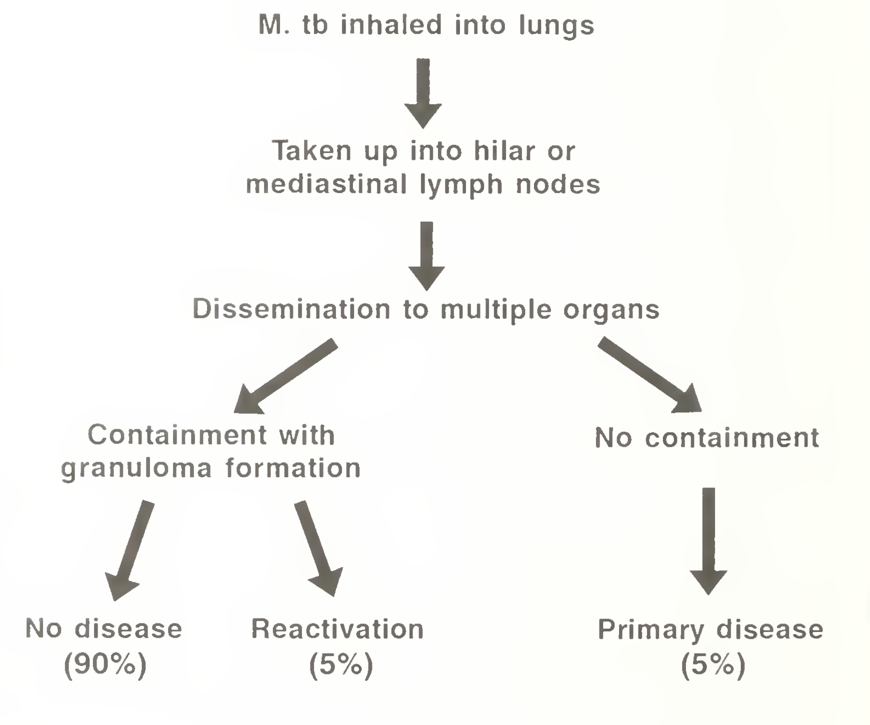
If one has a slightly more competent immune system, as in children 6 months to 3 years old, *M. tuberculosis* can be contained transiently after initial infection. The forms of primary disease that develop then are progressive primary pulmonary disease and tuberculous meningitis. The less life-threatening forms of primary tuberculosis are those that occur in children ages 3 to 13-years-old and adults with less severe immune compromise. These are mainly extrapulmonary manifestations such as tuberculous pleurisy, tuberculous bone and joint disease, particularly Pott's disease of the spine, and primary tuberculous lymphadenitis. If the infection is contained for more than 2 years, then patients generally will not manifest a primary form of tuberculosis.

Of the 95% of infected persons who contain the infection for the first 2 years, 5% eventually develop disease later in life with what is commonly referred to as reactivation tuberculosis. Thus, overall, approximately 10% of patients infected with *M. tuberculosis* ultimately develop active disease. By far the most common form of reactivation seen in adults occurs in the apical posterior segment of the lung. Reactivation can occur in any organ previously seeded and where viable *M. tuberculosis* has remained dormant within granulomas. Lymphadenitis, meningitis, bone and joint disease, renal or hepatic disease can all occur as reactivation disease.

Neonates and infants up to 6 months of age, patients with advanced AIDS, and other hosts with severely compromised cell-mediated immunity may develop a fulminant form of miliary tuberculosis within days or weeks after exposure.

We most commonly see the "classic" presentations of tuberculosis in Rhode Island because our cases arise from populations whose age and transmission dynamics are very close to those from which the original clini-

Fig. 1 – **Pathophysiology of tuberculosis**


M. tb inhaled into lungs
Taken up into hilar or mediastinal lymph nodes
Dissemination to multiple organs
Containment with granuloma formation
No containment
No disease (90%)
Reactivation (5%)
Primary disease (5%)

cal descriptions were made. Rhode Island has a large, young, immigrant population, which is developing tuberculosis primarily because their countries of origin have a high incidence of infection. Therefore, most of the adults seen in Rhode Island have classic pulmonary reactivation disease or extrapulmonary disease typical of reactivation. The pediatric cases have shown standard childhood manifestations of tuberculosis.

Diagnosis

It cannot be overemphasized that the diagnosis of tuberculosis can only occur if it is suspected first. Suspicion of the diagnosis should be correlated with the likelihood that the patient has come in contact with this organism. For example, Southeast Asian immigrants now living in Rhode Island have a tuberculosis case rate 22 times higher than that of white non-Hispanic US-born Rhode Islanders. The index of suspicion that the diagnosis is tuberculosis should be considerably higher for the Southeast Asian patient than in a white non-Hispanic Rhode Islander who is not an alcoholic or an inner city resident and has no family history of disease.

Thus, overall, approximately 10% of patients infected with M. tuberculosis ultimately develop active disease.

Actual isolation of *M. tuberculosis* is the gold standard for diagnosis.[1] Unfortunately, in many forms of the disease there is at best only a 50% chance that the organism will be isolated. A positive smear of acid-fast bacilli, either in sputum or in purulent material from the lesion, strongly suggests the diagnosis in a setting where the clinical syndrome and the epidemiology would lead one to suspect tuberculosis. Because mycobacteria other than *M. tuberculosis* can stain positively with acid-fast staining and because there can be some overlap with the clinical diseases caused by these other mycobacteria, a diagnosis based on positive smear is never as solid as one with an actual isolate. The finding of caseating granulomas in tissue specimens strongly suggests the diagnosis of tuberculosis, but granulomata can caseate in other infectious diseases as well as other medical disorders. While classic X-ray findings may suggest tuberculosis, they cannot establish the diagnosis.

Another diagnostic technique still under study is that of polymerase chain reaction (PCR) assay. PCR is a powerful technique that allows minute amounts of a specific target DNA to be amplified to detectable levels within 24 hours. PCR has been developed for the detection and confirmation of *M. tuberculosis* in clinical specimens and is currently under performance evaluation to define its sensitivity. If validated, this diagnostic technique will revolutionize the care of tuberculosis patients since it will provide next day results compared to the 6 weeks currently necessary for culture.

The skin test is the most misunderstood of all the tools in diagnosing tuberculosis.[1] About 10% of patients with active tuberculosis do not react to the Mantoux test, but this anergy can be of two varieties: complete anergy to all skin test antigens or specific anergy only to mycobacterial antigen (with preserved reactivity to other antigens such as mumps, trichophyton or candida). Global anergy is often found in adult patients who are debilitated or severely immunocompromised. In children and some adults with primary tuberculosis, up to 10% can manifest specific anergy to mycobacterial antigen but this usually disappears within the first month of treatment for tuberculosis. It is therefore extremely important to emphasize that a negative skin test in no way excludes the diagnosis of tuberculosis, even when accompanied by other positive antigen reactions. The skin test is really only a gauge of exposure to *M. tuberculosis* and it should not be used as a diagnostic predictor of active disease.

Treatment

The single most important variable in successful treatment is compliance with taking the medication. The predictable consequences of variable compliance are relapse and the emergence of drug resistance, both of which result in continuing transmission. The legacy of not ensuring compliance is directly reflected in the rising incidence of tuberculosis seen in Rhode Island and nationally, and in the increase in cases of drug-resistant tuberculosis. Compliance measures such as pill counting, repeated reinforcement, inducements and removing barriers to treatment such as transportation and fees often prove pivotal in the successful treatment of tuberculosis.

Rhode Island has a large, young, immigrant population, which is developing tuberculosis primarily because their countries of origin have a high incidence of infection.

Current treatment regimens for tuberculosis have been well outlined.[2] For pediatricians we recommend the guidelines of the American Academy of Pediatrics in the Report of the Committee on Infectious Diseases (the Red Book).[3] These guidelines vary slightly from the CDC guidelines and in those areas of difference we prefer the Red Book.

In cases with an isolate of *M. tuberculosis* sensitive to INH, rifampin and pyrazinamide, a 6-month regimen is acceptable, consisting of daily INH and rifampin for 6 months with PZA for the first 2 months.[4] A 6-month regimen using directly observed twice weekly therapy has also been studied.[5] A 9-month regimen of daily INH and rifampin is acceptable only for cases with fully sensitive isolates. It should be noted that all these regimens are of proven efficacy only in cases whose isolates were determined to be fully sensitive to these drugs. At the start of treatment, one is almost never in a situation of knowing this information.

Two aspects of treatment in Rhode Island lead us to have reservations about the blind implementation of these treatment protocols. First, although resistance to INH and/or rifampin is still relatively uncommon in Rhode Island, it is both sporadic and increasing. Of the five recent INH and/or rifampin-resistant cases, three did not have risk factors for drug resistance (a history of prior treatment themselves or exposure to patients with previous treatment). Had these three patients been initially treated with a conventional regimen of INH, rifampin and/or PZA, the consequences would have been disastrous with their continued infectivity and the difficulty of prophylaxing their contacts. We therefore recommend that almost all patients in Rhode Island initially be treated as if they had resistant organisms with INH, rifampin, PZA and either ethambutol or streptomycin. If culture results show that the patient's *M. tuberculosis* isolate is fully sensitive, then the treatment regimen can be reduced to 6 months and the drug regimen streamlined. This may soon become the national recommendation.

The second reservation is that the efficacy of the 6-month regimen is highly dependent on compliance. Unless one fully supervises therapy, ie, sees the patient ingest every dose of medication, most patients do not take anywhere near all the doses in a 6-month regimen, and the result is an unacceptable relapse rate. In the Tuberculosis Clinic, most patients are begun on INH, rifampin, PZA and ethambutol and end up completing a 9-month regimen during which they probably took their drugs for 6 of the 9 months. Justification for this approach is found in the fact that during the last 6 years approximately 200 patients in the Tuberculosis Clinic have been treated in this manner with only one documented relapse in a patient who completed therapy. This relapse rate is much lower than that reported in the medical literature, but it has been entirely predicated upon tailoring therapy to the specifics of the individual patient situation and the local epidemiology.

Treatment of extrapulmonary tuberculosis can be managed similarly to pulmonary tuberculosis. Some experts consider Pott's disease and meningitis to require longer durations of treatment. Treatment of children is essentially similar to that of adults with the reservations noted in the Red Book. Patients with HIV infection must be treated with a minimum of three drugs regardless of suspected drug resistance and there should be at least 6 months of treatment after cultures have become negative. Treatment of tuberculosis during pregnancy in general is INH, rifampin and ethambutol for 9 months. Expert consultation for suspected tuberculosis during pregnancy is advisable since complications of therapy are not uncommon.

All anti-tuberculosis drugs have significant side effects and should be dosed carefully per kilogram. The doses and the potential toxicities have been outlined.[2]

Contact Screening

No discussion of treating active tuberculosis is complete without considering the epidemiological sequelae of active disease. In a setting where a patient has active pulmonary tuberculosis, particularly smear-positive tuberculosis, it is essential to screen all contacts, particularly children. Screening is done by skin testing, physical examination and chest X-ray. It should be noted that decisions to undertake prophylaxis are based on the compendium of data from evaluating all contacts, rather than on a single piece of information. When appreciable transmission from an active case has occurred, as when several household contacts have markedly positive skin tests, even those contacts with initially negative skin tests or chest X-rays warrant prophylaxis. In the case of a child contact, the likelihood of rapid progression to active disease is considered significant enough that prophylaxis is usually begun even if the initial screening tests are negative. This can be discontinued after 3 months if the repeated screening tests are negative.

Conclusion

Dixie Snider, the director of the Tuberculosis Elimination Program at the Centers for Disease Control, has commented, "We are at a very critical point in history with regard to tuberculosis. What we do or don't do in the next few years will have a major influence on the future trend of tuberculosis in this country. We must do the best we can to prepare ourselves to meet the challenges and opportunities which lie ahead."

Tuberculosis has thrown down a gauntlet in Rhode Island and the next 5 years will show whether we take it up. The question is not how to eliminate tuberculosis because the medical and public health knowledge to do so is at hand. It is simply a matter of commitment–at the medical level to ensure screening, diagnosis and compliance with treatment, and at the societal level to allocate the resources needed to achieve the goal of tuberculosis elimination.

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Tuberculosis and the Health Department: The Present and the Future in Rhode Island

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Bela Matyas, MD, MPH
Barbara DeBuono, MD, MPH
Dolores DiOrio, BSN, MEd
Margaret Driscoll, RN

The Department of Health intends to develop a satellite network of additional clinical TB service provisions and to employ directly observed therapy, when appropriate, to increase compliance and treatment success.

Rhode Island's dramatic resurgence of tuberculosis over the last several years, together with the emergence of multidrug resistant tuberculosis, has prompted the state to review and modify its tuberculosis control and elimination programs. Resources devoted to tuberculosis control and elimination have been increased dramatically, and new strategies are being employed.

The annual incidence of tuberculosis in Rhode Island has been rising over the past several years. In 1991 there were 71 cases, for a crude rate of 7.1 per 100,000 population. Although this is lower than the national rate of 10.3 per 100,000 it is considerably more than the year 2000 goal of 3.5 per 100,000. Four cases were multidrug resistant.

Screening

In Rhode Island, tuberculosis screening is currently conducted by the Department of Health, private providers, health care facilities, drug and alcohol treatment centers, the state prison intake center, and a network of 13 community health centers across the state. Although a variety of populations are served, including specific high-risk populations, contacts, employees covered by regulatory requirements, and the public, screening programs have been variably implemented among these groups.

The state-supported Tuberculosis Clinic is involved in ongoing screening, contact-tracing and prophylaxis efforts, besides patient education, treatment and follow-up.

The Department of Health provides Purified Protein Derivative (PPD) for testing to any health care provider requesting it. Results of testing are maintained by the health care or other provider. Positive PPDs are either evaluated and treated in the private sector or are referred to the state-supported Tuberculosis Clinic at the Roger Williams Medical Center. Skin testing for contacts of active cases is conducted at the Providence office of the Health Department, and at special clinics as the need arises. Skin testing is also provided to contacts of cases who are treated in the private sector and to contacts of infected children who do not have active disease. Screening activities are conducted at the state's Sexually Transmitted Disease clinic, the Adult Correctional Institution Intake Center, and at two methadone maintenance sites. Routine screening is also incorporated at several residential alcohol treatment facilities.

School health regulations require pre-employment tuberculosis screening of all employees. State regulations do not require testing of students, although the results of testing are routinely recorded on each student's health card. Each school system may require health examinations or information along with those required by the state. Under this provision, the Providence and Pawtucket school systems require students who are new to their school system to be screened for tuberculosis. Regulations also exist for pre-employment screening of health care workers. Results of screening of all these groups are not routinely reported to the Health Department.

The state-supported Tuberculosis Clinic is involved in ongoing screening, contact-tracing, and prophylaxis efforts, besides patient education, treatment and follow-up.

Prevention

Regarding tuberculosis prevention activities, Health Department staff are actively engaged in on-going training of health, mental health, and social service staff at many screening sites. Department staff are also responsible

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for case management and contact tracing of active cases.

All reported cases of tuberculosis for 1991 have been entered into the "Tuberculosis Data System" developed by the Tuberculosis Division at the Centers for Disease Control. New cases are entered as they are reported and confirmed in 1992. Included in the documentation are antituberculosis drug regimen, laboratory results, contacts and the results of contact screenings.

These data generate information that can identify patient compliance with treatment, monitor bacteriological confirmation of the disease, and identify the results of contact investigation. For those patients who are receiving medical care at the state-supported Tuberculosis Clinic, the information from the database is used to construct a plan to work with the patient's medical care provider to follow the patient's progress and assist with any problems that may arise. Ultimate accountability for assurance that the patient completes therapy rests with the individual provider.

The extent of the tuberculosis problem in Rhode Island can be summarized in several key points:

- Despite the rising incidence rate of tuberculosis cases in Rhode Island, state resources have remained static until the current fiscal year.
- The incidence among children aged 0 to 14 increased dramatically from 1989 to 1990, from 2.1 per 100,000 to 9.5 per 100,000.
- Cases of active tuberculosis are concentrated in the Providence area.
- Most of the increase in tuberculosis cases since 1985 is in minority and foreign-born populations.
- There has been an increase in cases of multidrug resistant tuberculosis in Rhode Island.

Objectives

In response to this problem, the Director of Health has identified five key objectives for the Department's tuberculosis control and elimination program:

- To expand capacity in the public and private sectors to absorb the current and anticipated increase in prevalence of infection and disease among foreign-born and minority populations.
- To improve surveillance with more timely case reporting and data entry, and with enhanced data analysis.
- To expand screening, including both outbreak response and preventive screening, in high-risk populations.
- To assure treatment, through more intensive contact tracing and compliance monitoring.
- Expansion of the tuberculosis education and treatment network at the community level, through active involvement of community organizations and private health care providers.

Strategies

The Department of Health intends to employ the following strategies in seeking to achieve the Year 2000 objective of no more than 3.5 cases per 100,000 population:

- Increase physician accountability for treating their own patients for TB, with access to Health Department technical advice.
- Develop a satellite network of additional clinical TB service provision to serve special populations that have demonstrated difficulty accessing the system;
- Employ directly observed therapy, when appropriate, to increase compliance and treatment success, and use outreach staff to trace contacts of those infected aggressively.
- Combine PPD screening with anergy testing in HIV (and other high-risk) populations at targeted sites such as detoxification programs, HIV and STD clinics, and the state's prison.
- Increase community-based screening of high-risk populations.
- Provide culturally sensitive, community-based public education directed to target populations.

Information about tuberculosis designed for both the professional community and the general public is available free of charge from the Health Department and covers the general subject as well as specific subspecialty areas, such as TB/HIV and TB in foreign-born persons. Additionally, the Rhode Island Lung Association has public information literature available for distribution.

For more information regarding tuberculosis, contact:

- Rhode Island Department of Health
  3 Capitol Hill
  Providence, RI 02908-5097
  Phone: 277-2577; Fax: 272-1272
- State Tuberculosis Clinic
  Roger Williams Medical Center
  825 Chalkstone Avenue
  Providence, RI 02908
  Phone: 456-2247
- Rhode Island Lung Association
  10 Abbott Park Place
  Providence, RI 02903
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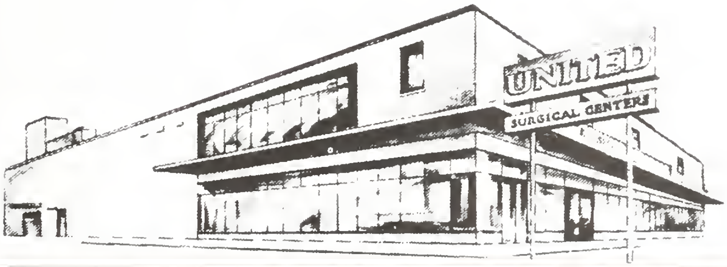

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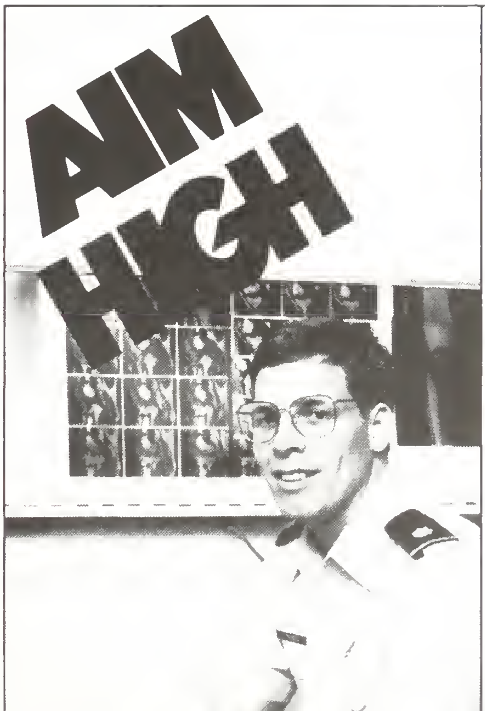

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**Rhode Island
Department of Health
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Director of Health**

Tuberculosis in Rhode Island

Annual tuberculosis (TB) morbidity in Rhode Island has increased 31% from 5.4 per 100,000 (53 reported new cases) in 1985 to 7.1 per 100,000 (71 reported new cases) in 1991 (Figure 1). Case rates for 1990 (7.5 per 100,000) and 1991 have regressed to the 1980 morbidity level, distancing Rhode Island from the Healthy People 2000 target case rate of 3.5 per 100,000.[1]

Among persons with reported active disease during 1990 and 1991, 86% were residents of Providence County, which demonstrated a county-specific rate during that period of 10.6 per 100,000. Providence County contains Rhode Island's major urban areas, which are home to most of the state's minority and foreign-born residents and also contain the largest concentrations of homeless persons and populations at high risk for drug abuse.

Overall, the proportion of minority cases increased from 1985 to 1991, while the proportion of non-Hispanic white cases decreased (Table 1). The incidence rate of tuberculosis in 1990 was 4.6 per 100,000 among white residents of Rhode Island. In minority populations however, the rates were dramatically higher, particularly among Rhode Island's Asians and Pacific Islanders, who have higher morbidity rates than the state's black and Hispanic populations and higher morbidity rates than those seen nationally among Asians and Pacific Islanders (Figure 2). In addition, the proportion of tuberculosis cases who were foreign-born increased over this period (Table 1).

Nearly one-fourth of all active tuberculosis cases in 1990 were children under 15 years of age, a considerable increase over previous years. An elevated rate of tuberculosis among children ages 0 to 14 years persisted through 1991, although this rate was reduced from the previous year (Figure 1). The cases in this age group were all Providence County residents in 1991, while all but one were residents of Providence County in 1990.

Children from racial and ethnic minority populations represented a majority of the TB cases among children under 15 years of age in 1990 (67%) and in 1991 (82%). During the two years, black children accounted for 7 (24%) of the 29 cases in this age group and Asian/Pacific Islander children accounted for 10 cases (34%). Hispanic children accounted for 4 cases (14%) among children in 1990 and 1991. Additionally, foreign-born children represented 28% of cases during 1990-91 among those ages 0 to 14 years.

Individuals with AIDS as well as those infected with HIV are at increased risk of developing tuberculosis. Of the total number of AIDS cases reported to the Department of Health from 1983 to 1991, 2.5% (12 cases) have been reported to have active tuberculosis. These reported TB cases among persons with AIDS were diagnosed between 1987 and 1991. Nine additional cases of tuberculosis were reported among HIV-positive individuals over this time period.

Multidrug resistant tuberculosis has begun to emerge as a serious problem in Rhode Island. In 1990, three (4%) unrelated cases of multidrug resistant pulmonary tuberculosis were reported; one additional case was reported in 1991.

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Table 1.–Number and Characteristics of Reported Cases of Tuberculosis, Rhode Island, 1985-1991

	1985-89	**1990-91**
Average Annual No. of Reported Cases	51	73
% Ages 0-14 Years	3.9	19.9
% Black	12.2	21.2
%Asian or Pacific Islander	18.8	22.6
% Hispanic	9.8	15.1
% Non-Hispanic White	59.2	41.1
% Foreign-Born	48.2	52.7

Submitted by the Division of Disease Prevention and Control, Bela T. Matyas, MD, MPH, Medical Director; Elizabeth Q. Nacar, MPH, Janet V. O'Connell, RN, MPH, Edward F. Donnelly, RN, MPH, Dolores DiOrio, RN, MEd, Kim Salisbury-Keith, MBA. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr, PhD.*

Fig. 1 – Reported New Cases of Tuberculosis per 100,000 Population, All Ages and Ages 0-14 Years, Rhode Island, 1985-1991

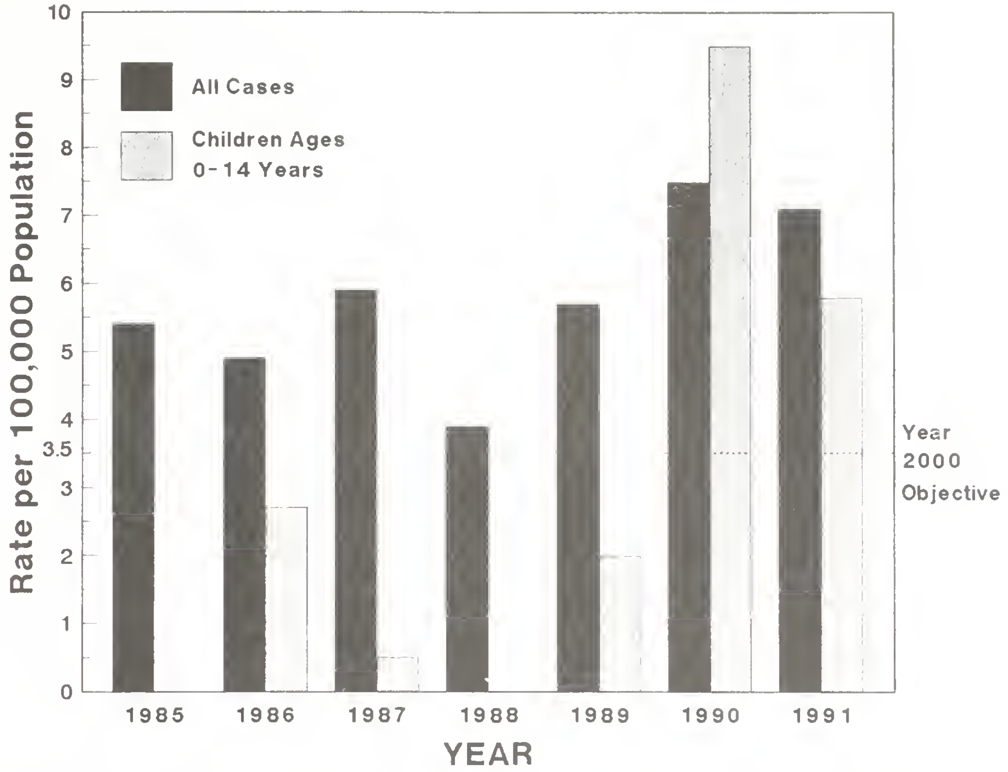
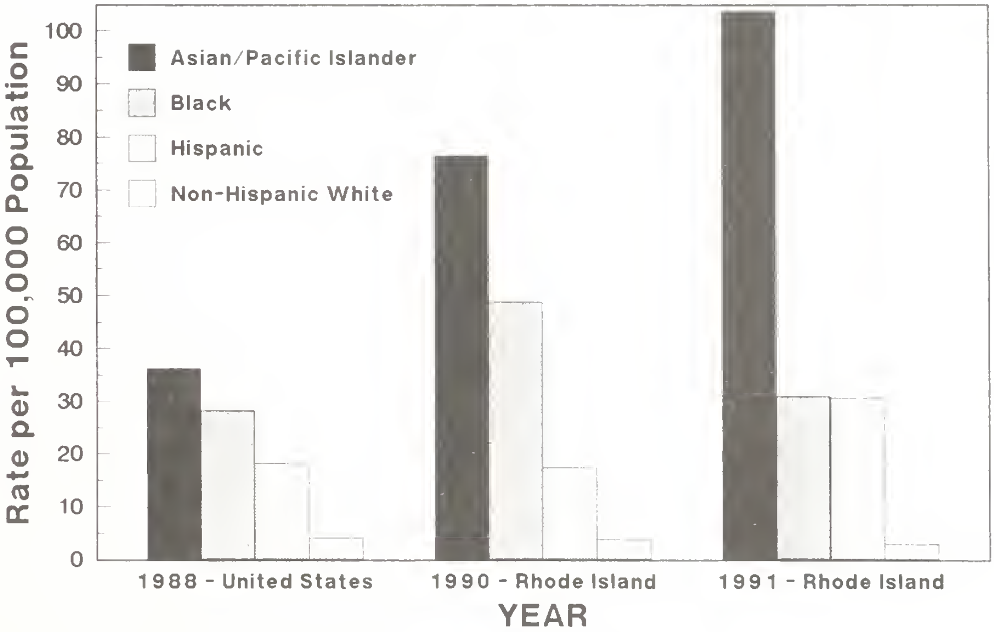


Fig. 2 – Reported New Cases of Tuberculosis per 100,000 Population, by Race and Hispanic Origin, Rhode Island, 1990-1991 and United States, 1988



1988 National Data Source:
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THE RHODE ISLAND MEDICAL JOURNAL

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

Ninety Years Ago
(September, 1902)

In accordance with the 1812 by-laws of the Rhode Island Medical Society, "There shall be an annual meeting of the Rhode Island Medical Society, holden alternately in the towns of Newport and Providence. When in Newport, it shall be holden on the last Wednesday in August; and when in Providence it shall be holden on the Tuesday next preceding the Commencement of Brown University." The lead editorial reminds the readership that the coming quarterly meeting of the Society shall be held in Newport and that booking passage on the morning boat from Providence will allow them to arrive in Newport in time for the scheduled meetings. The value and importance of periodic gatherings of physicians is emphasized: for professional consultations, for meetings of the various medical associations, to share information on medical progress, and for promoting "the fellowship of kindred minds."

A second editorial urges the readers to take advantage of a regularly published journal within Rhode Island "to publish the best of all that occurs at our meetings."

Announcement is made of the formation of an outpatient department for sick children at the Providence Lying-In Hospital, accepting patients up to age 10. Only medical and nutritional problems will be addressed; surgical cases are to be referred to other hospitals. The clinic is open 6 days a week and is under the charge of Drs. Halsey DeWolf, CW Higgins, PE Fisher, and HG Partridge.

The lead scientific article on pulmonary embolism is written by George S. Mathews, MD. The early history of pulmonic embolization and its pathogenesis is reviewed and the illuminating works of Hunter, Laënnec, Curveilhier, Virchow and others are cited. The author notes that a thrombus has its origins in the agglutination of blood platelets but notes that the origins of these platelets are quite unknown. The etiologic agents of thrombosis, according to the author, are: 1) alteration of the blood; 2) mechanical disturbances of the circulation; and 3) lesions of the vascular or cardiac walls. The role of circulating bacteria and/or bacterial toxins in the formation of thrombi, while suggestive, is still problematic. A number of cases of thrombi are then presented to display the variable clinical features of this disorder. In particular, the author summarizes the case of a 29-year-old woman who died of a massive pulmonary embolism attributable to lower limb thrombi associated with chlorosis. Thrombosis, states the author, is found in all grades of chlorosis. "The condition in chlorosis are most favorable for thrombus formation especially when associated with phlebitis. We have here an inflamed venous intima ready to arrest the blood platelets. Then we have a blood with increased fibrin." The treatment consists of absolute rest and the avoidance of any massage to the limbs. The occurrence of a pulmonary embolism says the author, is a rude shock, "coming almost like a thunder clap from a clear sky."

The second paper by Herbert Terry, MD, analyzes pus in the urine with a careful review of the various pathologic states – renal, ureteral, cystic, urethral, periurethral – that may contribute pus cells to the urine. The author expresses some faith in segmental urine analysis (ie, urine is passed into two containers and if the pus is confined to the first container, it then suggests that the inflammation is limited to the anterior urethra).

Fifty Years Ago
(September, 1942)

The principle article entitled "The Family Physician and the Children's Psychiatric Hospital" is written by Charles Bradley, MD. The author notes, first, that there is a paucity of psychiatric hospitals for the treatment of behavioral problems in children. In this paper, he distills his experiences of more than a decade in the treatment of several hundred maladjusted children at the Emma Pendleton Bradley Home in East Providence. He talks first of the critical importance of individualized therapy for each child, providing the young patient with a warm, personal and committed relationship with an experienced adult therapist. In describing his patients, he notes that the great majority are neither depressed nor psychotic. Instead, they are extremely active and often aggressive, rebelling against confinement and restriction while thriving on freedom and sincere attention. In surveying the indications for referral, Bradley states that the most common reason is that the child's behavior has become excessively annoying to others in the community. Some of the children then regard the hospital as a place of punishment, which inevitably retards the progress of the treatment. The article stresses the importance of active parental involvement in and sanction of the therapeutic process. Most practicing physicians are accustomed to rapid treatment schedules and equally rapid recoveries. In the case of behavioral problems in childhood, the process is time-consuming and change takes place only gradually. No rapid methods of treatment in behavioral problems within childhood have yet been devised. Because of the expense involved, hospitals of this type at the present time can exist only through the existence of public funds or private endowments. Judicious selection of cases, choosing only those with a reasonable likelihood of success, must be exercised since these specialized facilities are limited.

Edward S. Cameron, MD, describes the treatment of the fractured patella. The author offers the following guidelines: 1) operation within 48 hours after injury, provided the skin is intact; 2) removal of the more severely injured half of the patella in transverse fractures and excision of the entire patella in severe comminution with careful suture of the lateral fascial expansion; 3) that the only immobilization following the operation be a large dressing about the knee; 4) that the patient be out of bed before the 10th day; and 5) services of the physiotherapist are important. The average case should be ready for full work in from 3 to 6 months following the accident.

The lead editorial discusses the pressing need for more home nursing. The nation has been at war for almost a year and institutional resources for civilian illness are strained. The editorial urges more women to enroll in nurses-aide training to alleviate the pressures upon the understaffed hospitals and emergency rooms.

A farewell party is given to the members of the Rhode Island Hospital Unit, United States Army. The unit, physicians, nurses, ancillary personnel and administrators, were on the verge of departure to some unknown overseas military destination.

A notice from the Office of the Surgeon General, War Department, describes in detail the age and professional requirements of the various military ranks up to colonelcy.

Twenty Five Years Ago
(September, 1967)

The lead scientific article discusses current therapy for infectious mononucleosis and is written by Roswell H Johnson, MD, director of Health Services at Brown University. The author describes his experience with 90 cases during the academic year of 1966, noting the stereotyped clustering of signs and symptoms. Fever is frequently dromedary in character. The diagnosis in each case was verified by the existence of at least 5% atypical circulating WBC and a positive serological test. No etiologic agent has as yet been established. None of the 90 cases were roommates and none of the females or males in this series ever dated each other. Accordingly, therapy rests upon the following principles: bed rest, but, in general, no isolation; pain controlled by agents such as aspirin; and early ambulation. Prednisone was used only under certain prescribed circumstances. No complications were recorded in this series, and the only ruptured spleen documented at the university was a hockey player who was aggressively checked during a game and who did not have mononucleosis.

Joseph Izzi, MD, and Kenneth Knowles, MD, describe the clinical and radiological aspects of three cases of osteoid osteoma.

Anna Sandberg, MD, and Henry Litchman, MD, describe the case of a 4-year-old child with a slight limp and right thigh pain most severe at night. X-rays disclosed a circumscribed lesion and surgical resection verified the existence of an osteoid osteoma.

Ernest P. Mennillo, MD, and J. Brian May, MD discuss four cases of hypovolemic shock secondary to blood loss in the perinatal period.

Bencel Schiff, MD, and Stanley Simon, MD, describe the unusual occurrence of Bowen's disease limited to a single finger of a 45-year-old woman.

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*The recommended starting dose for Calan SR is 180 mg once daily. Dose titration will be required in some patients to achieve blood pressure control. A lower initial starting dosage of 120 mg/day may be warranted in some patients (eg, the elderly, patients of small stature). Dosages above 240 mg daily should be administered in divided doses. Calan SR should be administered with food.

†Constipation, which is easily managed in most patients, is the most commonly reported side effect of Calan SR.

‡Verapamil should be administered cautiously to patients with impaired renal function.

References: 1. Data on file, Searle. 2. Edmonds D, Würth JP, Baumgart P, et al. Twenty-four-hour monitoring of blood pressure during calcium antagonist therapy. In: Fleckenstein A, Laragh SH, eds. *Hypertension—the Next Decade: Verapamil in Focus.* New York, NY: Churchill Livingstone; 1987:94-100. 3. Midtbø KA. Effects of long-term verapamil therapy on serum lipids and other metabolic parameters. *Am J Cardiol.* 1990;66:131-151. 4. Fagher B, Henningsen N, Hulthén L, et al. Antihypertensive and renal effects of enalapril and slow-release verapamil in essential hypertension. *Eur J Clin Pharmacol.* 1990;39(suppl 1):S41-S43. 5. Schmieder RE, Messerli FH, Garavaglia GE, et al. Cardiovascular effects of verapamil in patients with essential hypertension. *Circulation.* 1987;75:1030-1036. 6. Midtbø K, Lauve O, Hals O. No metabolic side effects of long-term treatment with verapamil in hypertension. *Angiology.* 1988;39:102S-1029.

BRIEF SUMMARY

Contraindications: Severe LV dysfunction (see *Warnings*), hypotension (systolic pressure < 90 mm Hg) or cardiogenic shock, sick sinus syndrome (if no pacemaker is present), 2nd- or 3rd-degree AV block (if no pacemaker is present), atrial flutter/fibrillation with an accessory bypass tract (eg, WPW or LGL syndromes), hypersensitivity to verapamil.

Warnings: Verapamil should be avoided in patients with severe LV dysfunction (eg, ejection fraction < 30%) or moderate to severe symptoms of cardiac failure and in patients with any degree of ventricular dysfunction if they are receiving a beta-blocker. Control milder heart failure with optimum digitalization and/or diuretics before Calan SR is used. Verapamil may occasionally produce hypotension. Elevations of liver enzymes have been reported. Several cases have been demonstrated to be produced by verapamil. Periodic monitoring of liver function in patients on verapamil is prudent. Some patients with paroxysmal and/or chronic atrial flutter/fibrillation and an accessory AV pathway (eg, WPW or LGL syndromes) have developed an increased antegrade conduction across the accessory pathway bypassing the AV node, producing a very rapid ventricular response or ventricular fibrillation after receiving I.V. verapamil (or digitalis). Because of this risk, oral verapamil is contraindicated in such patients. AV block may occur (2nd- and 3rd-degree, 0.8%). Development of marked 1st-degree block or progression to 2nd- or 3rd-degree block requires reduction in dosage or, rarely, discontinuation and institution of appropriate therapy. Sinus bradycardia, 2nd-degree AV block, sinus arrest, pulmonary edema and/or severe hypotension were seen in some critically ill patients with hypertrophic cardiomyopathy who were treated with verapamil.

Precautions: Verapamil should be given cautiously to patients with impaired hepatic function (in severe dysfunction use about 30% of the normal dose) or impaired renal function, and patients should be monitored for abnormal prolongation of the PR interval or other signs of overdosage. Verapamil may decrease neuromuscular transmission in patients with Duchenne's muscular dystrophy and may prolong recovery from the neuromuscular blocking agent vecuronium. It may be necessary to decrease verapamil dosage in patients with attenuated neuromuscular transmission. Combined therapy with beta-adrenergic blockers and verapamil may result in additive negative effects on heart rate, atrioventricular conduction and/or cardiac contractility; there have been reports of excessive bradycardia and AV block, including complete heart block. The risks of such combined therapy may outweigh the benefits. The combination should be used only with caution and close monitoring. Decreased metoprolol and propranolol clearance may occur when either drug is administered concomitantly with verapamil. A variable effect has been seen with combined use of atenolol. Chronic verapamil treatment can increase serum digoxin levels by 50% to 75% during the first week of therapy, which can result in digitalis toxicity. In patients with hepatic cirrhosis, verapamil may reduce total body clearance and extrarenal clearance of digitoxin. The digoxin dose should be reduced when verapamil is given, and the patient carefully monitored. Verapamil will usually have an additive effect in patients receiving blood-pressure-lowering agents. Disopyramide should not be given within 48 hours before or 24 hours after verapamil administration. Concomitant use of flecainide and verapamil may have additive effects on myocardial contractility, AV conduction, and repolarization. Combined verapamil and quinidine therapy in patients with hypertrophic cardiomyopathy should be avoided, since significant hypotension may result. Concomitant use of lithium and verapamil may result in an increased sensitivity to lithium (neurotoxicity), with either no change or an increase in serum lithium levels; however, it may also result in a lowering of serum lithium levels. Patients receiving both drugs must be monitored carefully. Verapamil may increase carbamazepine concentrations during combined use. Rifampin may reduce verapamil bioavailability. Phenobarbital may increase verapamil clearance. Verapamil may increase serum levels of cyclosporin. Verapamil may inhibit the clearance and increase the plasma levels of theophylline. Concomitant use of inhalation anesthetics and calcium antagonists needs careful titration to avoid excessive cardiovascular depression. Verapamil may potentiate the activity of neuromuscular blocking agents (curare-like and depolarizing); dosage reduction may be required. There was no evidence of a carcinogenic potential of verapamil administered to rats for 2 years. A study in rats did not suggest a tumorigenic potential, and verapamil was not mutagenic in the Ames test. Pregnancy Category C. There are no adequate and well-controlled studies in pregnant women. This drug should be used during pregnancy, labor, and delivery only if clearly needed. Verapamil is excreted in breast milk; therefore, nursing should be discontinued during verapamil use.

Adverse Reactions: Constipation (7.3%), dizziness (3.3%), nausea (2.7%), hypotension (2.5%), headache (2.2%), edema (1.9%), CHF, pulmonary edema (1.8%), fatigue (1.7%), dyspnea (1.4%), bradycardia: HR < 50/min (1.4%), AV block: total 1°,2°,3° (1.2%), 2° and 3° (0.8%), rash (1.2%), flushing (0.6%), elevated liver enzymes, reversible non-obstructive paralytic ileus. The following reactions, reported in 1.0% or less of patients, occurred under conditions where a causal relationship is uncertain: angina pectoris, atrioventricular dissociation, chest pain, claudication, myocardial infarction, palpitations, purpura (vasculitis), syncope, diarrhea, dry mouth, gastrointestinal distress, gingival hyperplasia, ecchymosis or bruising, cerebrovascular accident, confusion, equilibrium disorders, insomnia, muscle cramps, paresthesia, psychotic symptoms, shakiness, somnolence, arthralgia and rash, exanthema, hair loss, hyperkeratosis, macules, sweating, urticaria, Stevens-Johnson syndrome, erythema multiforme, blurred vision, gynecomastia, galactorrhea/hyperprolactinemia, increased urination, spotty menstruation, impotence.

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Cover: A photograph of the paleolithic stone carving, the so-called Venus of Willendorf, unearthed in1908 near the Austrian village of Willendorf.

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COMMENTARIES

The Problem of Obesity

> *"Imprisoned in every fat man, a thin one is wildly signaling to be let out."* The Unquiet Grave, Cyril V. Connolly, 1945

American preoccupation with weight and weight control has escalated into a $32 billion a year industry. The number of Americans who admit to being "on a diet" is thought to be anywhere from 50 to 65 million with an even greater number claiming to be "holiday dieters."

This obsession with some ideal appearance and weight reached a crescendo in the late 1980s with intensified public interest in schemes for painless, guaranteed weight loss becoming fodder for daytime talk shows and supermarket tabloids. Simultaneously, public awareness of eating disorders has intensified; admitting to anorexia and bulimia has become the celebrity, soul-bearing of the '90s that alcoholism and drug problems had been in the '70s and '80s. When popular weight loss schemes are looked at critically, the intermediate and long-term results are remarkably poor, with up to 95% of dieters regaining all or almost all of their hard lost pounds.

As a medical problem, obesity is often treated as a secondary issue. Most overweight patients are told by their doctor to lose weight but essentially are left to their own devices to do this. Even when diets are provided, compliance and long-term results are poor. Physicians who make a serious effort at helping their patients lose weight often found the entire process frustrating because of slow progress, poor compliance and recidivism. In this issue of *Rhode Island Medicine*, we look at specific problems related to obesity and its management.

Our authors review obesity from several outlooks. Drs Pera, Clark and Abrams look at the course and treatment of obesity from a psychological and behavioral perspective. Dr Millman reviews a little-understood and poorly-recognized complication of morbid obesity—sleep apnea. Dr Thompson summarizes the surgical treatment of morbid obesity from his own unique, personal experience.

Frank J. Schaberg, Jr, MD
Guest Editor

In Feast and Famine

In earlier cultures, when a paucity of food was commonplace, obesity provided clear evidence of wealth and social importance. Indeed, in the few surviving examples of paleolithic art, the female figure was customarily portrayed as grossly obese (eg, the "Venus" of Willendorf on the cover of this issue). While it is possible that these carvings had been accurate representations of paleolithic women, it is more likely that they served as religious artifacts portraying the local paradigm of fecundity and abundance.

In primitive society, most labor was invested in obtaining food. When drought, famine and insect depredation were imminent threats, food was inevitably scarce. On those infrequent occasions when a community rejoiced in an excess of food, at harvest time perhaps, a feeding frenzy surely followed, particularly so since food preservation techniques had not been developed. Gluttony, the sin of forsaking dietary moderation, was then a periodic event gradually evolving into ritual feasts, which celebrated times of abundance and thanksgiving. Much is now known about the endogenous and behavioral causes of obesity; but one can't help but wonder whether some dim genetic memory of paleolithic starvation may incite instances of overeating.

As recently as the beginning years of this century, the overweight adult was an object of respect rather than one of medical concern. Harry Goldin remembers his mother saying: "In America, the fat man is the boss and the skinny man is the bookkeeper."

In the 19th century, the portly executive with a gold watch-chain festooned over an ample abdomen, accompanied by a matronly wife, was an icon of established authority. A fat man was symbolic of success, contentment, jollity and generosity. (Consider, for example, literary figures such as Falstaff, Mr Pickwick and Saint Nicholas.) Julius Caesar reflects: "Let me have men about me who are fat; sleek-headed men and such as sleep o'nights; Yond' Cassius has a lean and hungry look; he thinks too much; such men are dangerous." Literary villains, on the other hand, were alienated and bitter souls; gaunt creatures such as

Iago, Cassius, Legree or Richard III, men who were lean and mean.

The morbid face of obesity emerged when insurance companies undertook life expectancy studies earlier this century. They discovered a statistical relationship between excessive body weight and shortened life-span. More precise, prospective epidemiologic surveys then defined obesity as a major risk factor in cardiovascular, neoplastic and certain endocrine diseases. As this century matured, obesity, now a weighty problem, became less and less a desirable state. If the body masses of United States presidents are any criterion of the American image, we seem to have reduced our idealized weight from the portly, sedentary McKinleys and Tafts to the spare, and often jogging Kennedys and Bushes.

But the mere recognition of the serious medical implications of corpulence does not translate automatically to easily achieved weight reduction in our patients. Eating, like sex, is one of the driving forces of life that are rarely stayed after minimal biological needs are met. Man is the only animal that eats when he is not hungry, drinks when he is not thirsty, and has sex in all seasons, it has been said.

Many identify food as one of the great pleasures of life. Beyond its obvious nutrient role, food is central to virtually every religious or secular ritual. Birth, wedding, retirement and death are each commemorated by a defining meal with prescribed foods. Rare is the human who employs food merely for its sustaining qualities.

To expect an obese individual to lose weight following a simple instruction from his physician is about as naïve as expecting celibacy in college students after a warning lecture in chapel. If losing weight were readily accomplished, we then would expect to encounter no obese people except for those suicidally inclined. Instead, within developed nations, obesity is a common event affecting up to one-third of certain adult populations. Stunkard has noted: "Most obese persons will not enter treatment; of those who do, most will not lose weight; and of those who lose weight, most will regain it." In a world where famine is currently commonplace, it may seem perverse to identify overeating as a frequent problem. Yet, awkward or not, obesity persists as a major challenge in the practice of medicine.

Obesity, in the view of many, is a refractory disorder difficult to treat and is vaguely akin to alcoholism, a problem substantially more complex than the mere controlling of caloric intake.

What do we know about this disorder? We know that it is more common in women than in men; more common in rural than urban populations; that there is a remarkable, inverse correlation between obesity and socioeconomic status; 30% of the impoverished, 16% of middle class and but 5% of upper class adults are overweight. In Europe, obesity is generally more common in the more southern nations; in the United States it is similarly more often seen in southern states, and is more frequent among blacks and hispanics regardless of economic status. When populations are segregated by religion, obesity appears more frequently in Roman Catholics and least frequently among Jews and particularly certain non-Catholic Christian sects. Obesity, for example, is identified in fewer than 3% of Episcopalians, a tribute, perhaps either to Anglican forbearance or the inelegance of their cuisine.

Do obese people like to be overweight? A character in a 1939 Orwell novel says "I'm fat, but I'm thin inside. Has it ever struck you that there's a thin man inside every fat man, just as they say there's a statue inside every block of stone?"

For the foreseeable future, then, eating seems destined to satisfy much more than hunger pangs. Its role, beyond basic sustenance of the essential micro and macronutrients, is diverse, pervasive and tangled. To some, it is a cherished preoccupation, to others an addiction, and to still others an activity infiltrated with social imperatives, taboos, religious prohibitions and uncounted, swirling unconscious forces. The dangers of overeating are patently clear; the medical interventions needed to reverse this hazard, however, require a thorough understanding of the social and biological imperatives which encourage its appearance. Dr Frank Schaberg, Jr has gathered articles from those Rhode Island colleagues skilled in the behavioral, pharmacological and surgical aspects of obesity for this issue of *Rhode Island Medicine*.

Stanley M. Aronson, MD

A Concordancy of Names

When describing the clustering of certain animal species, writers who are customarily adventurous with words tend to confine themselves to the same collective nouns. Thus we invariably have schools of whales, flocks of geese, prides of lions and herds of deer. We would experience a jarring sense of verbal mismarriage were we to read about herds of geese or flocks of whales or schools of lions.

It is hard to say why each major species seems to define its groupings inflexibly, wedded to but one distinctive noun. Certainly there is nothing inherently lionine about a pride or deerish about a herd. The Bible, a text not given to needless descriptors, was quite content to talk about pairs or great numbers without further specifics.

A widely read book (*An Exaltation of Larks*, by James Lipton) recently has gathered many of these nouns of multitude, noting that most of them were not of recent invention but could be traced back, with little change, to a 1486 printed text in English (a mere decade, incidentally, after the introduction of printing to England). The volume, called *The Book of St. Albans*, is a primer of etiquette that dwells upon the socially correct names to be employed when conversing with others on hawking, hunting, or heraldry; its authoress was one Dame Juliana, a prioress of the Sopewell Nunnery.

Many of the catalogued verbal unions persist to this day; indeed, some are used so mindlessly that they now are considered cliches. These regularized partnerships include: a clutch of eggs; a gaggle of geese; a charm of finches; a plague of locusts; and a litter of puppies. Others, more arcane, are so inventive as to be intriguing; they are nevertheless as historically authentic as the commonplace ones, though rarely uttered or written today. Some examples: a leap of leopards, a rafter of turkeys, a skulk of foxes, a seige of herons, a bouquet of pheasants, and a parliament of owls. Each descriptor seems to have a reason for being — whether it illuminates some fragment of species behavior, expresses metaphorically some biologic reality, or is merely onomatopoetic. Some of the pre-Tudor St. Albans nomenclature ventures well beyond terms of hunting or hawking. Thus, we encounter a prudence of vicars, an obeisance of servants, a drought of bottlers, a poverty of pipers, and of course, a cluster of grapes.

The innocent diversion of selecting pungent, mordant or merely frivolous noun-metaphors continues to the present. Our current literature is strewn with such memorable and insightful phrases as a string of violinists, a twaddle of orators, a ring of jewelers, a galaxy of astronomers, a temperance of preachers, and, in describing clusters of street walkers, a flourish of strumpets or an anthology of pros.

The genus, *medicinae doctor*, embraces many species, representatives ofwhich tend to migrate seasonally in aggregations called specialty conventions. At one of these professional gatherings, a few months back, a notice appeared on a blackboard asking for new ways to describe throngs of physicians trained in each of the major clinical specialties. By the conclusion of the scientific meeting a few days later, the following volunteered suggestions had accumulated on the blackboard.

A rash of dermatologists
A run of gastroenterologists
A clone of geneticists
A wince of dentists
An eruption of pediatricians
A pulse of cardiologists
A swarm of entomologists
A synapse of neurologists
A pile of proctologists
A cluster of biostatisticians
A graft of plastic surgeons
A smothering of anesthesiologists
A diet of nutritionists
A squabble of social scientists
An outbreak of epidemiologists
A delirium of psychiatrists
A skeletal crew (or joint) of orthopedists

This journal will be pleased to enlarge upon this list through suggestions proffered by its readers.

Stanley M. Aronson, MD

EDITOR'S MAILBOX

To the Editor:

AIDS patients are unlikely to develop intra-abdominal disease requiring celiotomy. Approximately 4% of AIDS patients admitted to urban area hospitals undergo elective or emergent celiotomy.[1,2] The postoperative fate of these selected few is less clear.

The table below shows the mortality in AIDS patients following celiotomy over the past 3 years in several urban institutions. On initial inspection there is a wide variation in outcome. Emergent operations tend to carry a higher mortality rate, as expected. The main purpose of this letter is to bring attention to the particular patient population of these studies. 80% of patients in one study were intravenous drug abusers and had the highest mortality.[3] In both studies where homosexual patients predominated, lower mortalities were recorded. Comparisons of emergent and elective operations in the predominantly homosexual patient population of Dezeil *et al* yielded no significant difference in mortality.[4] The data from Wilson et al omits AIDS risk factors.[5]

Clearly AIDS risk factors are important variables in the equation that allows a surgeon to predict operative mortality. Each patient with AIDS needs to be individualized as to the overall risk and benefits of surgery.

Steven Schechter, MD
The Miriam Hospital

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	Mortality			
Study	**Elective**	**Emergency**	**Overall**	**Predominant Risk Factors**
Laraja et al (1989)	–	–	22%	Homosexual
Wilson et al (1989)	9%	46%	23%	Unknown
Burack et al (1989)	–	70%	70%	Intravenous
Deziel et al (1990)	15%	25%	20%	Homosexual

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Current Treatment of Obesity: A Behavioral Medicine Perspective

Vincent Pera, MD
Matthew M. Clark, PhD
David B. Abrams, PhD

The hallmark of comprehensive treatment is behavioral intervention coupled with caloric restriction, exercise, nutritional education and specialized treatment for other problem areas such as eating disorders or psychiatric comorbidity.

Obesity represents a serious medical and psychological problem. In the United States, obesity is estimated to occur in 60 million Americans. More than $30 billion are spent annually on attempts to lose weight,[1] and these attempts often are not successful.

Recently a few researchers have suggested that obesity should not be treated at all.[2] A number of public interest and self-help groups also have suggested that the poor self-image and negative cultural views of obesity should be corrected since they are at the root of eating disorders and public exploitation by some members of the diet industry. Furthermore, negative images are promoted in many advertising campaigns that associate slimness with success, sexuality, and countless products. While there is merit in the need to break the association of obesity with negative psychosocial values, the majority of studies indicate that obesity is unhealthy, especially as body weight increases. Treatment programs are available and success is attainable in programs with realistic goals. Responsible programs incorporate weight loss into a comprehensive total lifestyle philosophy of health promotion that addresses biological, psychological and social aspects of adjustments without promising magical "instant cures or quick fixes."

Obesity is defined as an excess of body fat and has been classified according to a number of parameters by various researchers. Stunkard[3] proposed a classification system based on the percentage above ideal body weight: mild obesity (20% to 40%), moderate obesity (41% to 100%), and severe obesity (greater than 100%). This classification system corresponds well to relating the degree of obesity to medical comorbidity and to appropriate levels of treatment.

Medical comorbidity as related to obesity has been well documented by many researchers. Diseases include hypertension, diabetes, hyperlipidemia, cardiovascular disease, cholelithiasis, arthritis, sleep apnea, gout, hypoventilation syndrome, and some cancers.[4] Degree of obesity is associated with increasing prevalence of these medical illnesses[5] and early mortality.[6] Obesity is higher among females and the lower income and lesser educated groups within the population.[7,8]

Obesity is a complex disorder and its full etiology is not yet well understood. Endogenous causes, such as hypothyroidism, hypothalamic syndromes, pituitary dysfunction, and Cushing's syndrome, are found among a few obese persons. For most obese patients, no significant medical cause can be found. For the patient with exogenous obesity, genetic, personal and environmental factors may interact and contribute to the problem.[9] Current genetic research is focused on metabolic rate as a function of inheritance with a number of studies suggesting some correlation between these variables.

Obese patients also suffer from significant psychological and psychosocial morbidity. Prejudice and discrimination against the obese are well-documented.[10] Children as young as 6 years old evaluate obese children negatively;[11] obese individuals experience lower acceptance rates into colleges;[12] and employers discriminate against the obese.[13]

Research regarding effects of behaviors on obesity has focused on eating behaviors and physical activity. Brownell et al[14] reported that obese individuals tend to be less physically active than nonobese individuals. Bray,[15] however, found evidence that obese individuals may be either as active or less physically active as the nonobese individual. Regarding energy intake, it has been shown that obesity is not necessarily related to total caloric intake but obesity is correlated with total fat intake.[16] Clearly,

ABBREVIATIONS USED:

DSM: Diagnostic and Statistical Manual of Mental Disorders
EKG: Electrocardiogram
VLCD: Very-low-calorie diet

Vincent Pera, MD, Matthew M. Clark, PhD, and David B. Abrams, PhD, are with the Center for Behavioral Medicine. The Miriam Hospital, Providence, Rhode Island and are also affiliated with the Departments of Medicine and Psychiatry and Human Behavior, Brown University School of Medicine, Providence, Rhode Island.

in identifying contributors to obesity, caloric intake amount, caloric content and activity level play variable roles for a given individual.

Given that obesity is a complex, multifactoral disorder,[17] specific psychological factors may affect weight status of some individuals. Indeed, psychological distress,[18] psychiatric comorbidity,[19] binge eating,[20] or an eating disorder[21] all may influence the weight status of some obese individuals. Marital distress or difficulty forming close and meaningful relationships also should be considered since significant others can play a strong role in either supporting or unwittingly sabotaging treatment or the long-term maintenance of weight loss.

The liquid protein modified fast represents the most widely used and accepted version of the very-low-calorie diet.

Binge-eating is defined as a rapid consumption of a large amount of food with a perceived loss of control during the episode.[22] Obese binge eaters report a greater sense of loss of control over their eating, a greater fear of gaining weight, and a higher level of body image disturbance than obese nonbinge eaters.[23] There is a high prevalence of psychiatric comorbidity and psychological distress in obese binge eaters.[24] Not surprisingly then, obese binge eaters demonstrate higher attrition and lose less weight[25] than obese nonbinge eaters. Estimates of the prevalence of binge eating range from 8% to 55%.[25]

Up to 5% of obese individuals purge (vomit, use laxatives, use diuretics, fast or overexercise) after a binge episode. These individuals therefore, meet DSM criteria for bulimia nervosa.[22] Body image disturbance may consist of both negative evaluation of body size and behavioral avoidance of situations that produce body image disturbance (going to the beach, looking in mirrors).[27] Additionally, some obese individuals describe their body as loathsome and view it with contempt. These beliefs may remit after weight loss or may require treatment.[10]

A Current Treatment Approach

Although genetic, psychological, biological, cognitive-behavioral and social cultural-environmental factors are all implicated in the etiology of obesity, many current programs focus on only one or two aspects of the factors that may influence successful weight loss. Such programs can be successful and cost-effective with patients who have relatively uncomplicated obesity and have not yet failed to respond to treatment. For many, however, obesity is truly a condition that requires an interdisciplinary philosophy to evaluate, treat and prevent relapse after treatment adequately. Increasingly, the consensus is that obesity be treated in a specialty clinic setting using an interdisciplinary team.[28] Minimally the team should include psychologists and psychiatrists specializing in eating disorders; internists with training in obesity management, endocrine disorders and nutrition; exercise physiologists; and nutritionists with specific training and interest in treating the obese population. Programs that omit one or more of these specialists are incomplete and risk failing to assess or treat a significant aspect of obesity at a time when research shows that successful treatment is difficult to achieve even when using an ideal program.[17]

A comprehensive program can offer the specialty treatment setting required to evaluate and treat the moderate and severe level obese patient. This is especially important for patients who have tried and failed with other forms of treatment. Here a comprehensive medical, psychological, exercise and nutritional evaluation is performed to determine the most appropriate treatment for a given patient. The patient's level of obesity, past weight loss attempts, medical and psychological issues, as well as social and environmental factors all must be considered.

A thorough medical evaluation including serum and urine studies is performed to clarify endogenous causes of obesity and to determine the patient's overall medical status.[29] Conditions that require close medical monitoring during the active weight loss process are identified, as are those that might represent a contraindication to a specific weight loss modality, such as the very-low-calorie diet (VLCD). Resting EKG and exercise tolerance testing are performed on all patients to evaluate cardiac risk and determine the appropriate level of exercise.

Exercise has been shown to be helpful in maximizing weight loss and in minimizing the lowering of metabolic rate that can occur with caloric restriction.[30,31] The exercise physiologist analyzes exercise tolerance test data then constructs a safe, individualized exercise program for a given patient. It is important to consider the patient's confidence regarding his or her ability to exercise since concerns in this area can affect compliance.[32]

Programs frequently minimize the importance of the psychological/psychiatric evaluation.[18] As reviewed earlier, binge eating, body image disturbance, and psychological distress may all affect treatment outcome. Therefore, clinicians also should conduct a thorough psychosocial evaluation.

The psychosocial evaluation includes questions about current eating habits, frequency of binge episodes, potential positive aspects of their obesity, purging, body image, and motivation for weight loss. Evaluation of specific cognitive-behavioral factors is essential, including treatment expectations (anticipated lifestyle changes, goal weight, perceptions of the potential for weight loss to "cure" unrelated life problems), any negative consequences of previous weight loss experiences and appropriateness for individual versus group treatment is warranted. Evaluation of goal weight is important since some patients have an unreasonably low goal,[33] which may contribute to attrition, low self-esteem and weight regain.[17] The patients' motivations and their confidence (self-efficacy) about their ability to lose weight should be evaluated carefully across the five key situational factors that research shows are important in a patient's successful treatment.[34] Related cognitive-behavioral questions about the individual's readiness to exercise and their confidence about their ability to exercise are also important, as these cognitions may influence the individual's adherence to an exercise program.[32]

The presence of psychiatric comorbidity is not necessarily a contraindication to weight loss; however, if individuals' psychiatric status is directly related to their weight status (as may be the case in some persons who have been sexually abused, for example), if they are abusing drugs, if their current level of functioning would interfere with adherence (for example, an acutely psychotic individual) or if they are unwilling to seek adjunctive treatment for their psychiatric comorbidity, then weight loss treatment may not be appropriate at that time. The psychological evaluation may indicate contraindications to treatment, whether individual treatment is more appropriate than group treatment, or whether adjunctive psychological/psychiatric treatment is warranted.

The final component of the initial evaluation of the obese patient involves nutritional assessment. The patient's caloric intake prior to treatment is monitored to determine calories consumed and percentages of fats, fiber, carbohydrates, etc. making up the patient's diet. This information will be helpful in determining the most appropriate treatment modality and level of caloric restriction for a given patient.

Once the patient evaluation is complete, medical conditions, physiological findings, weight status, physical activity level, eating habits, body image, psychological functioning and psychiatric comorbidity are all considered in the matching of a given patient to appropriate treatment.[17,25] The hallmark of comprehensive treatment is behavioral intervention coupled with caloric restriction, exercise, nutritional education and specialized treatment for other problem areas such as eating disorders or psychiatric comorbidity.

Treatment goals consist of pounds lost, improvements in medical comorbid conditions, improvements in body fat distribution, increases in physical activities, improvements in nutritional intake, improved psychological functioning, reduced frequency of binge episodes, improved body image, reduction of medications and other parameters.

A behavioral approach has its origin in cognitive-behavioral social learning theory.[17] Typical components include self-monitoring (record keeping), stimulus control procedures (reducing eating cues in the environment), development of healthy eating habits, disruption of eating chains, cognitive therapy, problem-solving, nutritional education, exercise instruction, and relapse prevention training.[35,36] A high-fat diet may contribute to both mortality and obesity.[17,37] Therefore the nutritional goal should consist of increasing consumption of foods high in complex carbohydrates and fiber and reducing the consumption of fat and cholesterol. Increased physical activity generally will improve an individual's health status, increase weight loss and enhance weight maintenance. Participation in a supervised exercise program improves weight maintenance.[38] Therefore, supervised exercise should be a treatment component.

The degree of caloric restriction and overall treatment plan is determined through a consideration of all information gathered in the initial evaluation application of a risk-benefit assessment for a given patient. Modalities for caloric restriction include balanced deficit diet which impose a caloric restriction in the > 1200 kcal per day range to achieve active weight loss of 1 to 1.5 pounds per week. This approach, in conjunction with behavioral intervention, a structured exercise program and nutritional education has been shown to be most successful in the treatment of patients in the mild obesity category.

For patients in the moderate and severely obese categories, more intensive treatment is often indicated. Medical conditions must be weighed again, and a risk-benefit ratio applied as more intense caloric restriction modalities may carry increased risk for a patient with a given medical condition. Often, it is that very condition that warrants significant weight loss in a given patient.

Low calorie diets (800 kcal to 1200 kcal per day) and very-low-calorie diets (VLCD) (<800 kcal per day) are now used in the treatment of moderately obese patients who have not been successful with a balanced deficit diet approach and in the treatment of severely obese patients. The liquid protein modified fast represents the most widely used and accepted version of the very-low-calorie diet. Recent research has demonstrated the safety and effectiveness of this form of treatment in moderate and severe level obese patients with concurrent medical problems.[37-42] It is clear that safe, appropriate implementation of this modality requires medical administration and monitoring by a specially trained physician, intensive psychological intervention focusing on behavior modification, a highly structured exercise program and extensive nutritional education. The focus of this treatment must emphasize long-term behavioral change and maintenance of the weight loss rather than the short-term goal of rapid weight loss.

Treatment goals consist of pounds lost, improvements in medical comorbid conditions, body fat distribution, increases in physical activities, improvements in nutritional intake, improved psychological functioning, reduced frequency of binge episodes, improved body image, reduction of medications and other parameters. Clearly, amount of weight loss should not be the sole consideration in the evaluation of success during active weight loss, nor pounds kept off be the only determinant of success regarding weight maintenance.

At present, most behavior therapy and balanced deficit diet programs (usually 1200 kcal per day for women and 1500 kcal per day for men) are 16 to 20 weeks in length and the average weight loss is 1 to 1.5 pounds per week. Approximately, 65% of this weight loss will be maintained for 1 year; however, at 3 to 5 years, most individuals have regained their weight.[17]

Programs consisting of less than 800 kcal per day (VLCD) are also most effective when used in a behavioral medicine center with sufficient resources to represent the disciplines required for the specialized team approach. Females usually lose 2 to 5 pounds per week and males 3 to 6 pounds per week on the VLCD when used in a behavioral program. Approximately 60% of the weight loss is maintained 1 year after treatment and approximately 19% of the weight loss is maintained at 3 years.[43,44] Recently, it has been shown that medical conditions that improve with weight loss continue to demonstrate improvement despite some percentage of weight regain. Although these programs sometimes are offered in free-standing clinics or physician offices, little research with outcome data is available in these settings.

Current recommendations suggest the use of the VLCD as the appropriate form of treatment for the severely obese patient. It is recommended that surgical intervention be considered only for those severely obese patients who are unsuccessful with the very low calorie modality. This surgical intervention should also include a structured behavioral component.

As previously mentioned, most patients participating in weight loss programs will experience weight regain at follow-up.[44,45] It is strongly encouraged that patients who have participated in an active weight loss program continue with a maintenance program. Studies have shown that patients who are most successful at maintaining weight loss are those who exercise regularly, directly confront their problems and have established new eating habits consistent with their overall lifestyle.[46] Maintenance treatment, formulated to prevent relapse, has proven effective in preventing weight regain. Maintenance treatment consists of regular exercise instruction, dietary education, social support and relapse prevention training.[47]

Summary

Obesity is a complex biopsychosocial phenomenon. It has a profound effect on patients' physical and psychological health. Due to the complexity of the problem and the recidivism following treatment, it is recommended that obese patients receive in-depth interdisciplinary evaluation to match them appropriately to comprehensive treatment. Participation in an interdisciplinary comprehensive active weight loss treatment program followed by participation in a professionally led biweekly behavioral maintenance program that included social influence and aerobic exercise has generated maintenance of 83% of initial weight loss at an 18-month follow up.[48] This comprehensive multidisciplinary treatment approach, best offered in a behavioral medicine center setting, represents state-of-the-art treatment at this time and can result in long-term medical and psychological benefits for the obese patient.

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Sleep Apnea in the Morbidly Obese

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During an obstructive apnea, there is collapse of the pharyngeal airway.

During the last 15 years, there has been increasing evidence that obstructive sleep apnea is a common and potentially serious medical problem, especially among obese populations. This review will define the obstructive sleep apnea syndrome, present signs and symptoms of the disorder, and clarify the causal relationship between sleep apnea and obesity.

Definitions

The definition of apnea has been set arbitrarily as a cessation of airflow lasting 10 seconds or longer. Whereas central apneas involve a total absence of respiratory effort, obstructive apneas involve continued respiratory efforts against an obstructed pharyngeal airway. At times the airway only becomes partially obstructed, resulting in an obstructive hypopnea. A hypopnea has been arbitrarily defined as either a 50% decrease in airflow from baseline or partial reduction in airflow leading to a 4% fall in oxygen saturation and/or an arousal from sleep. Obstructive sleep apnea syndrome has been defined as 5 obstructive apneas per hour sleep or >30 events per night. Other authors have used a cut-off of >15 apneas and hypopneas per hour sleep. Because of recent findings of an unexpected 35% to 40% incidence of frequent apneas and hypopneas during sleep in otherwise healthy subjects over age 65, these definitions have become extremely controversial. From a clinical standpoint, the designation of obstructive sleep apnea syndrome should only be applied to those individuals who are found to have frequent apneas and hypopneas during sleep and have symptoms resulting from either sleep fragmentation and/or recurrent hypoxemia and acidosis.

Clinical Manifestations of Obstructive Sleep Apnea

Clinical features that develop in obstructive sleep apnea syndrome (Table 1) are a direct consequence of recurrent collapse of the pharynx each night.[1] During an obstructive apnea there is collapse of the pharyngeal airway. Pharyngeal muscles relax normally during sleep. If a patient has a narrower, more collapsible pharynx to begin with, however, it may close off completely during sleep. Occlusion occurs when the forces working to collapse the airway, such as the negative intraluminal pressure produced by diaphragm contraction, are greater than the forces that dilate the pharyngeal airway, specifically contraction of the oropharyngeal muscles. Occlusion persists because repeated respiratory efforts only augment the vacuum suction exerted against the pharynx. With cessation of airflow, there is resulting hypercapnia and hypoxemia and eventually the patient arouses from sleep. When this occurs, the pharyngeal muscles contract, the airway opens up under pressure and the patient makes a loud snoring sound.

Snoring often is the major complaint that brings the patient to the physician. Unlike most benign snorers who only snore on their back patients with sleep apnea typically snore in any position. Often the sounds are so loud that the spouse is forced to sleep in a different room to get some rest. The spouse may complain of loud snorts and gasps and may observe apneic episodes. The patient is often unaware of snoring or apneic episodes though may on occasion awaken in a panic with a choking sensation. At other times the patient will complain of frequent awakenings during the night. A minority of patients may wake so often that they actually think they have never fallen asleep and thus present with insomnia.

The classic symptom of obstructive sleep apnea syndrome is excessive sleepiness, and some patients may have been labeled previously and inappropriately as having narcolepsy. The expression of this symptom is quite variable and patients may only note drowsiness or periods of dozing off while sitting quietly in a chair watching television after finishing dinner. Often this mild degree of drowsiness is blamed on "working too hard." In more severe cases, the pa-

ABBREVIATIONS USED:

BMI: Body mass index
CPAP: Continuous positive airway pressure
CT: Computerized tomography
EKG: Electrocardiogram
EMG: Electromyogram

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Table 1.– **Clinical Features of Obstructive Sleep Apnea**

Snoring
Observed apneas
Choking arousals
Fragmented sleep
Insomnia
Daytime sleepiness
Memory problems
Poor attention and concentration
Personality changes
Impotence

tients feel tired and exhausted upon awakening in the morning and may even feel drugged or disoriented. During the remainder of the day, the patient may experience uncontrollable sleepiness at work, while driving an automobile or even participating in a conversation. The real danger is that the patients will fall asleep driving. Clearly there is a higher prevalence of motor vehicle accidents in patients with significant obstructive sleep apnea.[2] Patients may also have problems with memory and attention-concentration, and may have difficulty solving complex problems. Personality changes including increased irritability and even clinical depression may develop. Some patients complain of impotence as well. The mechanism behind these symptoms are unclear and the relative role of sleep fragmentation and nocturnal hypoxemia remain controversial.

During each apneic episode, there are changes in arterial blood gases that are associated with profound hemodynamic changes. With each apneic event, systemic and pulmonary artery pressures rise and then return to baseline values with resumption of ventilation. Early observational studies on blood pressure in patients with essential hypertension demonstrated that blood pressure typically falls during sleep. Blood pressure in patients with sleep apnea, however, cyclically rises. There are also changes in heart rate with the most common arrhythmia being sinus arrhythmia. Vagal tone increases as one tries to ventilate against a closed glottis, and it is not uncommon to see bradycardia during the obstruction alternating with tachycardia as airflow resumes. In fact, severe cases of sleep apnea may be associated with second degree atrioventricular conduction defects and sinus arrest lasting up to 13 seconds.[3] Ventricular ectopy may result if the oxyhemoglobin saturation falls below 60%.

Sustained systemic hypertension during the daytime is frequent in patients with sleep apneas as well. About half of patients with obstructive sleep apnea are hypertensive.[4] Conversely, recent studies have demonstrated that up to 30% of patients with "essential hypertension" have obstructive sleep apnea. Though it once was thought that sleep apnea caused daytime hypertension in these patients, it is now believed that the association between obstructive sleep apnea and hypertension is due primarily to obesity and age. A recent comparison of our male sleep apnea patients with men from the Pawtucket Heart Health Program demonstrated that the prevalence of hypertension was the same in the two groups if one normalized for age and body mass index (BMI). Only in young (25-44 years) morbidly obese men with a BMI >31 kg/m^2 was there any evidence that obstructive sleep apnea itself could have any independent effect on blood pressure.[4]

Unlike most snorers who only snore on their back, patients with sleep apnea snore in any position.

Patients with obstructive sleep apnea also may have elevated resting pulmonary artery pressures. The true incidence of this finding is unknown. One recent study from Germany suggested that 20% of patients with sleep apnea have elevated resting pulmonary artery pressures and an additional 48% have elevated pulmonary artery pressure with exercise.[5] In severe patients, there may be subsequent right-sided heart failure. This appears to be related in many to the degree of daytime hypoxemia.

Many patients who actually have evidence of right-sided heart failure have been classified as having the "Pickwickian Syndrome," also known as the obesity-hypoventilation syndrome. This syndrome consists of morbid obesity, hypersomnolence, pulmonary hypertension, cor pulmonale, daytime hypoxemia with resultant polycythemia and chronic hypercapnia. Not all patients with the obesity-hypoventilation syndrome, however, have obstructive sleep apnea. Patients without sleep apnea may develop the syndrome due to a defect in their ventilatory control mechanism.

Relationship Between Obstructive Sleep Apnea and Obesity

The majority of patients with obstructive sleep apnea are obese. The prevalence varies between studies depending on whether one uses percent of ideal body weight, BMI or the sum of subscapular and triceps skinfolds as an index of obesity. Recent evaluation of our male patients with obstructive sleep apnea showed that 85% were obese using a definition of obesity of a BMI >27.8 kg/m^2 and 100% were obese if one used a sum of the subscapular and triceps skin folds.[6]

The prevalence of sleep apnea in obese populations is not well known. The incidence of obstructive sleep apnea in the general population has been estimated to be about 1% to 3% and it may be 12 to 30 times higher in the morbidly obese.[7] In a study of 27 morbidly obese patients (13 men and 14 women) with a BMI >40 kg/m^2 the occurrence of sleep apnea was 76.9% in men and 7.1% in women.[8] This relationship between sleep apnea and obesity does not appear to be purely an adult phenomenon. Though sleep apnea in children and adolescents is more commonly caused by enlarged tonsils and adenoids, obesity may also be the cause of sleep apnea in this age range. Mallory et al describe 41 children and adolescents who weighed >150% of ideal body weight. A sleep history questionnaire showed that all patients snored and 32% had been observed to have apneic episodes. All night polysomnography revealed obstructive sleep apnea in 37% of the patients.[9]

There is direct evidence to support the contention that obesity is a cause of obstructive sleep apnea. Severity of obstructive sleep apnea not only has been shown to correlate with BMI, but also with external neck circumference.[10,11] A recent study of the upper airway using magnetic resonance imaging has demonstrated excessive fat surrounding the collapsible segment of the pharynx in patients with sleep apnea compared with weight-matched control subjects.[12] This excessive fat deposition would tend to narrow the pharyngeal cross-sectional area and increase pharyngeal collapsibility.[13] In fact, the pharynx has been demonstrated to be less collapsible in patients with sleep apnea after weight loss.[14,15] Obese patients with sleep apnea have also been demonstrated to have larger tongues as demonstrated by 3-dimensional CT scan reconstructions.[16] With sleep, this enlarged tongue could potentially fall back into the airway thus contributing to the obstruction.

Other Predisposing Factors

As shown in Table 2, other factors contribute to the development of sleep apnea. The syndrome is more prevalent in men as compared to women. It has been stated that premenopausal women are relatively protected from developing sleep apnea because of circulating progesterone, which is a known ventilatory stimulant. This has never been proven, and obesity may be the most important determinant for the development of sleep apnea in women.

Table 2. – **Predisposing Factors in the Development of Obstructive Sleep Apnea**

Obesity
Male sex
Increasing age
Enlarged tonsils and adenoids
Macroglossia
Retrognathia
Nasal obstruction
Evening alcohol or sedative ingestion
Acromegaly
Hypothyroidism

. . . there is a higher prevalence of motor vehicle accidents in patients with significant obstructive apnea.

Narrowing of the pharynx by enlarged tonsils or adenoids, macroglossia, or retrognathia also can predispose one to the development of sleep apnea. Often, patients with obstructive sleep apnea have a deeply set palate and long, thick uvula as well.

Pharyngeal collapsibility during sleep also may be increased by the ingestion of alcohol and sedatives before sleep. Studies have demonstrated a decrease in pharyngeal muscle tone directly related to blood alcohol levels. The pharynx also collapses readily if the nose is plugged. Nasal breathing during sleep appears to be associated with low resistance whereas oral breathing during nasal obstruction is associated with a much higher resistance breathing. This increased resistance necessitates higher inspiratory intra-thoracic pressures and this negative pressure works to further collapse the pharynx.

Certain endocrine abnormalities may predispose a patient to sleep apnea. Acromegaly can lead to obstructive sleep apnea because of anatomical narrowing of the pharynx. Hypothyroidism may cause obstructive sleep apnea not only through anatomical narrowing of the pharynx, but also by blunting ventilatory responses to hypoxia and hypercapnia.

Diagnosis of Obstructive Sleep Apnea

The best way to diagnose obstructive sleep apnea is by all-night polysomnography. This study involves monitoring of electroencephalograms, electroculograms and submental electromyograms (EMG) to determine sleep staging and ascertain the degree of sleep fragmentation. Apneas and hypopneas can be detected by oral and nasal thermistors that reflect airflow, and either chest or abdominal bands or intercostal EMGs to monitor respiratory effort. Finger pulse oximetry to detect the degree of desaturation and continuous EKG monitoring also are important. Anterior tibialis EMGs should also be monitored to exclude another common condition that may fragment sleep, nocturnal myoclonus.

The decision to study a patient can be made by clinical history and by the presence of risk factors. Crocker, et al demonstrated that the presence of obesity >30 kg/m^2, hypertension and observed apneic episodes during sleep are highly predictive of a positive polysomnography for obstructive sleep apnea. In fact, if all three were present, there was greater than a 95% chance of finding more than 15 obstructive apnea and hypopneas per hour of sleep in a population of excessively sleepy snorers.[17]

Treatment of Sleep Apnea

It is imperative to individualize therapy to fit the needs of the patient. Therapy not only should be directed at trying to correct polysomnographic abnormalities, but more important, abolishing symptoms. All patients should avoid taking alcohol or sedatives in the evening. It is very important that nasal patency be maintained. This may require the use of saline nasal spray, steroid nasal sprays, antihistamines, decongestants or even corrective surgery. If the patients are found on all-night polysomnography to have primarily apneas on their back, they can easily be conditioned to sleep on their side. This can be accomplished by putting a ball in a sock, clipping the top of the sock to the label of the pajama top and the bottom of the sock to the lower thoracic spine. Whenever the patient lies on his back, discomfort from the ball causes the patient to arouse and move onto his or her side.

Weight loss is an important principle of therapy in all patients. As with other obese patients, any approach to weight loss should include behavior modification and exercise. Even modest weight loss has been shown to have a profound effect on the severity of sleep apnea.[14,15,18] The decrease in the severity of the sleep apnea may not only be due to an increase in airway volume, but also a decrease in pharyngeal collapsibility. Weight loss may cure sleep apnea in some patients. This is independent of the type of weight reduction program.[19,20] In other patients, the degree of anatomical abnormalities may influence the effectiveness of therapy.[21] Obviously, significantly enlarged tonsils or retrognathia would not resolve with weight loss.

Other therapeutic options that are commonly used in obstructive sleep apnea include the nightly use of nocturnal nasal continuous positive airway pressure (CPAP) or a uvulopalatopharyngoplasty. With nasal CPAP the patient sleeps with a nose mask strapped to the head and connected with tubing to a blower that pulls air from the room and forces air down the nose and throat, thus effectively keeping the pharynx open. This is a reasonable method of controlling sleep apnea as the patient attempts to lose weight. The advantage to using this approach is that the patient's daytime symptoms and nocturnal hemodynamic abnormalities can be controlled during the weight loss process. The uvulopalatopharyngoplasty involves removal of the uvula and part of the soft palate as well as any redundant tissue in the oral and nasal pharynx. Often, this procedure does not work and one of the major limiting factors is the coexistent presence of morbid obesity. It seems to have its best effect in young, thin patients who have an open nose, no evidence of retrognathia, and a deeply set palate, long uvula and enlarged tonsils. Newer approaches to treatment include mouth retainers and mandibular advancement procedures.

Conclusions

Obstructive sleep apnea is a common clinical syndrome. There is evidence to support that its greater prevalence occurs in more obese populations and that obesity is a direct cause of the syndrome in many patients. Modest weight loss is extremely beneficial in many patients with sleep apnea due to an increase in pharyngeal volume and a decrease in pharyngeal compliance.

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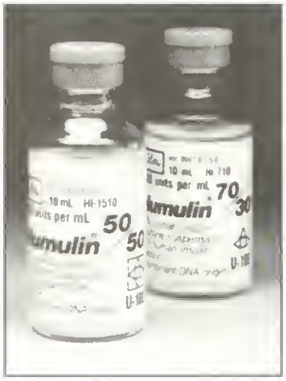

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Surgery for Morbid Obesity: An Overview

William R. Thompson, MD

Any bariatric surgical procedure mandates a lifetime commitment to the patient because of the potential for metabolic, mechanical, hematologic and psychologic problems.

Individuals who are 100 pounds above ideal weight generally are described as being morbidly obese or to suffer from clinically severe obesity.[1] Non-operative measures for long-term weight reduction in this group of patients are generally ineffective.

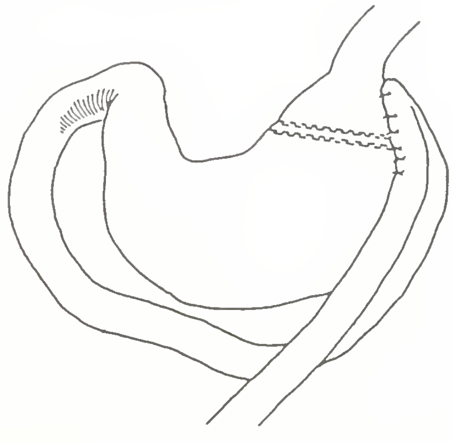
Clinically severe obesity affects approximately 4.7% of men and 7.2% of women between the ages of 21 and 75 years.[2,3] In addition to serious psychosocial problems, these individuals have a significant increase in morbidity and mortality.[4] Severe clinical obesity is associated with a 10-fold increase in hypertension, a 3-fold increase in cardiovascular disease, a 5-fold increase in diabetes, and a 2.6-fold increase in cholelithiasis.[5] There is also an increased risk for respiratory dysfunction, osteoarthritis, thromboembolic disease, renal disease, skin disease, infection, and uterine cancer.[2,4] Lew and Garfinkel[6] noted a 50% increase in mortality in men who were greater than 40% above ideal weight, and Drenick[2] noted a 12-fold increase in men from 24 to 34 years of age who suffered from clinically severe obesity.

Although surgical treatment obviously does not correct the underlying biological and psychological causes of morbid obesity, surgical techniques have evolved into reasonably effective and safe methods for significant weight reduction in this population.

The surgical procedure that was widely accepted in the 1970s, the jejunal-ileal bypass, was based on malabsorption by exclusion of 90% of the small bowel from the digestive tract. This is a relatively simple operative procedure, and weight loss was significant. It became obvious after several years that metabolic complications were frequent and sometimes devastating.[1] Liver failure, cirrhosis, electrolyte imbalance, dehydration, bypass enteritis, diarrhea, oxalate kidney stones, and osteoporosis were among the serious complications encountered. About 40% to 50% of individuals who have undergone this procedure have had a take-down of the anastomoses with re-establishment of gastrointestinal continuity. Very few jejunal-ileal bypasses are now performed.

Since its introduction in 1966 by Mason and Ito,[7] gastric surgery for clinically severe obesity has become the preferred surgical technique. Masons' original operation was a gastric exclusion procedure that resulted in a bypass of the entire distal stomach. Good clinical results were based on the principles of early satiety, aversion to certain types of high calorie foods, mild dumping, and a small element of malabsorption. There were numerous failures of the original procedure because of too large a proximal pouch and too large a stoma. Modifications of the original exclusion technique have evolved into two accepted stapling procedures: a simple loop gastrojejunostomy (Fig 1), and a Roux-en-Y gastrojejunostomy (Fig 2). These two procedures are still in current use

Fig. 1– Simple Loop Gastrojejunostomy



William R. Thompson, MD, is Acting Chief of Surgery, Rhode Island Hospital, Providence, Rhode Island, and Clinical Professor of Surgery, Brown University School of Medicine, Providence, Rhode Island.

by many bariatric surgeons. The Roux-en-Y procedure has gained the most popularity since the potential problem of bile reflux esophagitis is circumvented. Both procedures are dependent on the necessity of a small proximal pouch and a small stoma.

In 1984, we reported our experience with complications and weight loss in 150 consecutive gastric exclusion patients.[8] The operation was a modification of the stapled Alden loop gastrojejunostomy.[9] Construction of a 30 cc proximal pouch and a 1 cc stoma proved to be essential (Fig 1). All patients were followed up to 6 years (mean 27.8 months), and only one patient was lost to follow up. On the average, patients lost 75% of their excess weight, 38% of their original weight, and stabilized at 30% above their ideal weight. The weight loss results compare favorably with other reported series.[10,11] The mortality rate was acceptable (1.4%), but 54.7% of patients had at least one complication, primarily the result of post-surgical biliary disease or ventral hernias. These problems were later addressed by removal of the gallbladder at the time of surgery, and the wound closure technique was changed. There was a small but significant incidence of staple line dehiscence, stomal enlargement, and pouch enlargement requiring surgical correction. Bile reflux esophagitis has developed in some patients necessitating conversion to a Roux-en-Y type of correction in four individuals.

Metabolic studies were reported later in this same group of patients.[12] Hypertension was eliminated in 96% of the subpopulation, diabetes in 100%, gout in 100%, hyperlipidemia in 91%, and hepatic function was improved in 95%. Because of the lack of external financial support, these studies were concluded after a 6-year period. It should be stressed that although the metabolic studies conducted over a 6-year period were very favorable, 10 and 15-year data are not available.

A prospective hematologic evaluation of the same group of 150 patients was subsequently reported.[13] The information obtained was somewhat disquieting and confirmed our earlier impressions that gastric bypass patients require close follow up throughout their lifetimes. The data indicated that anemia, iron deficiency, B_{12} deficiency, and folate deficiency were considerably more frequent and severe after gastric exclusion surgery than previously recognized. As a result of this experience, it was concluded that, at a minimum, all gastric exclusion patients should be placed postoperatively on an oral multivitamin preparation that contains iron, folate, and B_{12}. In the course of follow up, additional oral iron, B_{12}, and folate supplementation may become necessary.

Because of the potential hematologic problems that may occur as a result of gastric exclusion and because of the ease of performance, horizontal gastroplasties (or gastric partitioning procedures) (Figs 3 and 4) became extremely popular in the late 1970s and early 1980s. Stomas between the proximal and distal stomach were placed either on the greater curvature side of the stomach or in the middle of

Fig. 2– Roux-en-Y Gastrojejunostomy

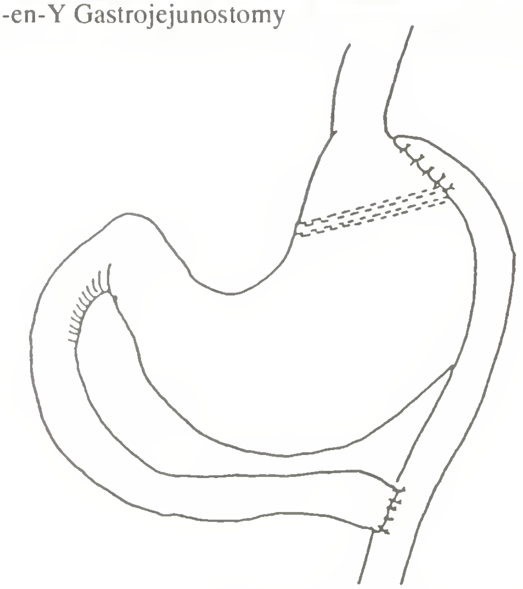
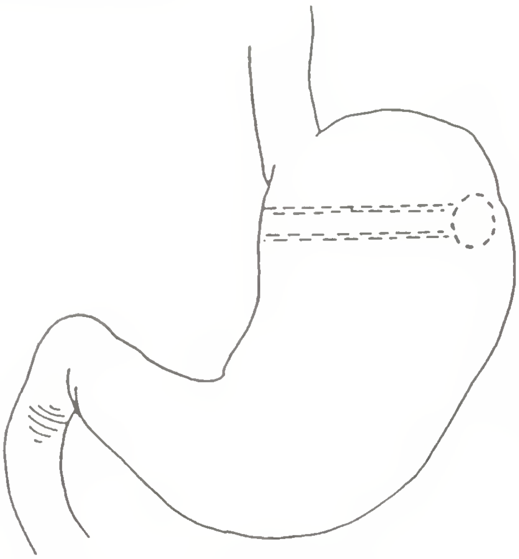


Fig. 3–Horizontal Gastroplasty



the staple line. Thousands of these procedures were performed without sufficient preliminary investigation. Unfortunately with time, the stomas increased in size and significant late weight gain was almost a universal problem. At best, only 20% of these patients have had satisfactory weight losses.

In the last 10 years, another procedure, vertical banded gastroplasty (Fig 5), has become a popular operation for morbid obesity.[14] The operation is relatively easy to perform and the pouch and stoma are on the lesser curvature side of the stomach. Success is based on small pouch size and a small stoma. Gastric continuity is maintained. In spite of some very favorable reports regarding this procedure,[14,15] there are recent well-conducted studies appearing in the literature that would indicate that, overall, the Roux-en-Y gastric exclusion procedure is preferable.[10,11,16] Significant complications that have been reported from the vertical banded gastroplasty are stomal stenosis, erosion of the stomal band, staple line dehiscence, and gastroesophageal reflux.[10,16] Long-term weight loss is significantly less than with the gastric exclusion procedures.[11,16] A number of surgeons with a large experience in both the Roux-en-Y gastric exclusion procedure and the vertical banded gastroplasty have returned to the exclusion procedure.[10,11,16] It should be noted, however, that Mason and large number of other bariatric surgeons continue to perform and promote the vertical banded gastroplasty.[14,15] Provided that the patients are carefully followed for potential hematological problems and promptly treated, my preference is the Roux-en-Y procedure. It is obvious that up to this point, an ideal operative procedure has not been developed.

In spite of the lack of availability of the ideal operation for the morbidly obese population, the potential benefits of significant weight loss from either the Roux-en-Y procedure or the vertical banded gastroplasty justify their performance. Lessons that should have been learned over the past 30 years include the necessity for a well-trained team, complete facilities for early care and long-term follow up, modern systems for data collection, and a reporting system based on accepted standard criteria. Any bariatric surgical procedure mandates a lifetime commitment to the patient because of the potential for metabolic, mechanical, hematologic, and psychologic problems. The team should include not only bariatric surgeons but also internists, endocrinologists, plastic surgeons, psychiatrists, nurses, dietitians, and social workers. Procedures should be limited to well-equipped institution with a special interest in obesity where accurate results are reported periodically over extended periods of time.

In summary, a team approach, careful patient selection, attention to technical detail, and close long-term follow up are of paramount importance in providing successful results in the surgery for the morbidly obese.

Fig. 4– Horizontal Gastroplasty

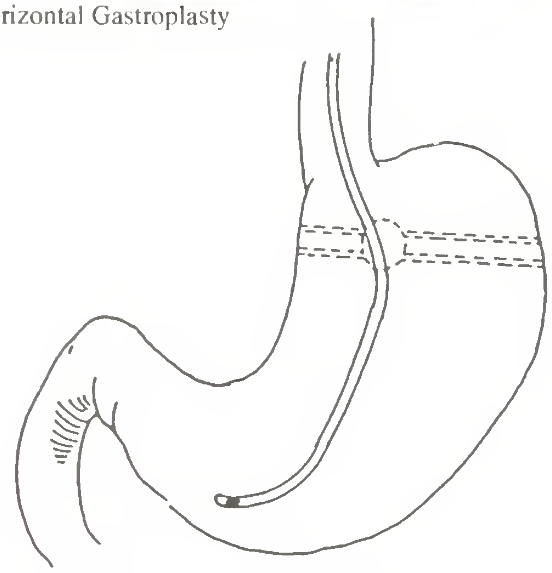
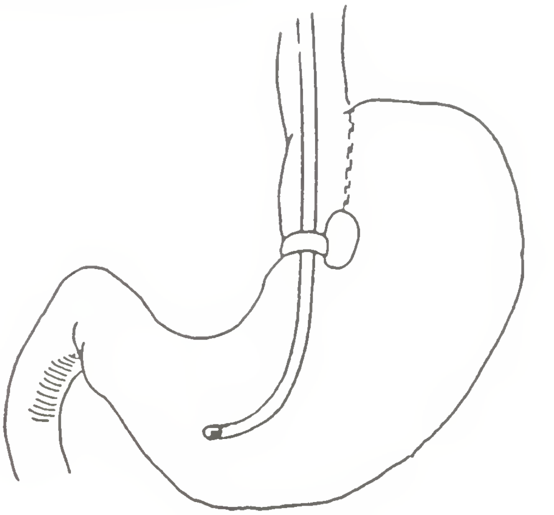


Fig. 5– Vertical Banded Gastroplasty



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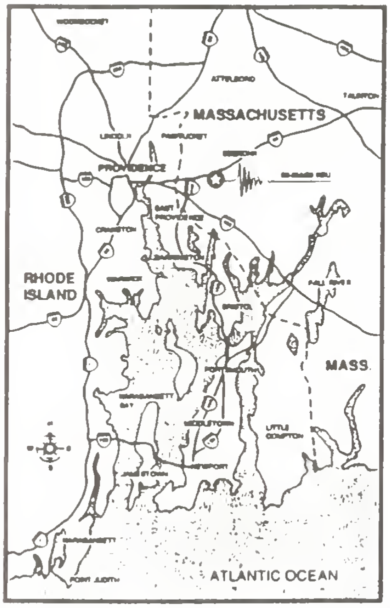

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Serving up Nutrition Instead of Guilt

Edward N. Brandt, Jr., MD, PhD
Paul R. Thomas, EdD, RD

Trying to eat a healthful diet these days is no piece of cake. It's little wonder so many Americans don't eat as well as they should.

Many people do try to limit certain foods or to improve nutrition for their children. But anyone who has ever flinched at the bathroom scale or examined the wares at the local supermarket knows how demanding it can be to eat a healthful diet.

If cars crashed hourly at an intersection, we'd redesign the intersection rather than blame all of the drivers. Yet we tend to view the eating problems of countless Americans as signs of personal weakness rather than of something awry with the broader situation.

Throughout the United States, per capita consumption of fresh fruits and vegetables, breakfast cereals and low-fat milk has increased. Many consumers report using less salt and fat in their foods. However, people also are eating more high-fat cheeses and frozen desserts, fats and oils, snack foods and candy.

Perhaps consumers are being too hard on themselves in viewing such lapses as personal failures. The path to better nutrition is hindered by too many barriers, from fast foods loaded with saturated fat to incomplete labels on packaged foods. Surveys indicate that many people lack both the information and skills to eat better. What they need is not guilt but more help.

Thanks to continuing efforts by government, the food industry, health care providers and educators, it's easier than ever to eat well. The recent work of the federal government to develop better food labels, for example, could do a great deal to promote better nutrition. Yet it is possible to do more. We served on a committee of the Institute of Medicine of the National Academy of Sciences that recently identified numerous ways to make things easier for eaters.

Supermarkets, for example, could provide nutritional information at points of purchase, such as with signs in the produce or dairy aisles, or with tags indicating that certain products are a good nutritional buy. Restaurants could provide nutritional analyses of their menu items.

Educators could help Americans make sense of this information, teaching pre-schoolers good eating habits along with their A-B-Cs and providing their older brothers and sisters with nutrition education throughout their schooling.

Company cafeterias, television shows and others could promote nutrition education more informally. For example, just as television producers have reduced the gratuitous use of alcohol and drugs on many programs, so might characters begin eating healthier foods. On the show "Cheers," for example, why not have Norm eat something healthier than beer nuts? Informal efforts are especially important for changing eating patterns among less educated and poorer Americans, who generally have worse diets.

Then there is government, which has tremendous leverage to encourage better nutrition through the School Lunch Program, farm subsidies and a host of other initiatives. At the very least, facilities such as public hospitals and government agency headquarters should provide good foods in their own cafeterias and kitchens.

Consumers who shop carefully in supermarkets generally can put together a healthful diet, and food producers have improved the content of many items by cutting back on the fat, salt and sugar. Yet consumers also need access to nutritious foods elsewhere. For many people, "dinner" means a stop at a fast-food restaurant or a microwaved frozen entree rather than a home-cooked meal. Instead of gorging on fat, they should be able to eat a healthful meal with a minimum of bother.

Consumers need help not only from restaurants and food producers, but from government, health care providers and everyone else involved with food in our country. Of course, they still must take responsibility for what they eat. But it should not be so difficult or confusing for them to eat wisely.

As matters now stand, our national diet is too high in guilt and too low in practical information and healthful choices. Rather than blaming people for failing to overcome the situation, it's time to cook up something better.

Edward N. Brandt, Jr, MD, PhD, executive dean of the Health Sciences Center, University of Oklahoma, Oklahoma City, chaired a committee of the Institute of Medicine of the National Academy of Sciences that examined the nation's diet and health. Paul R. Thomas, EdD, RD, was the committee's study director.

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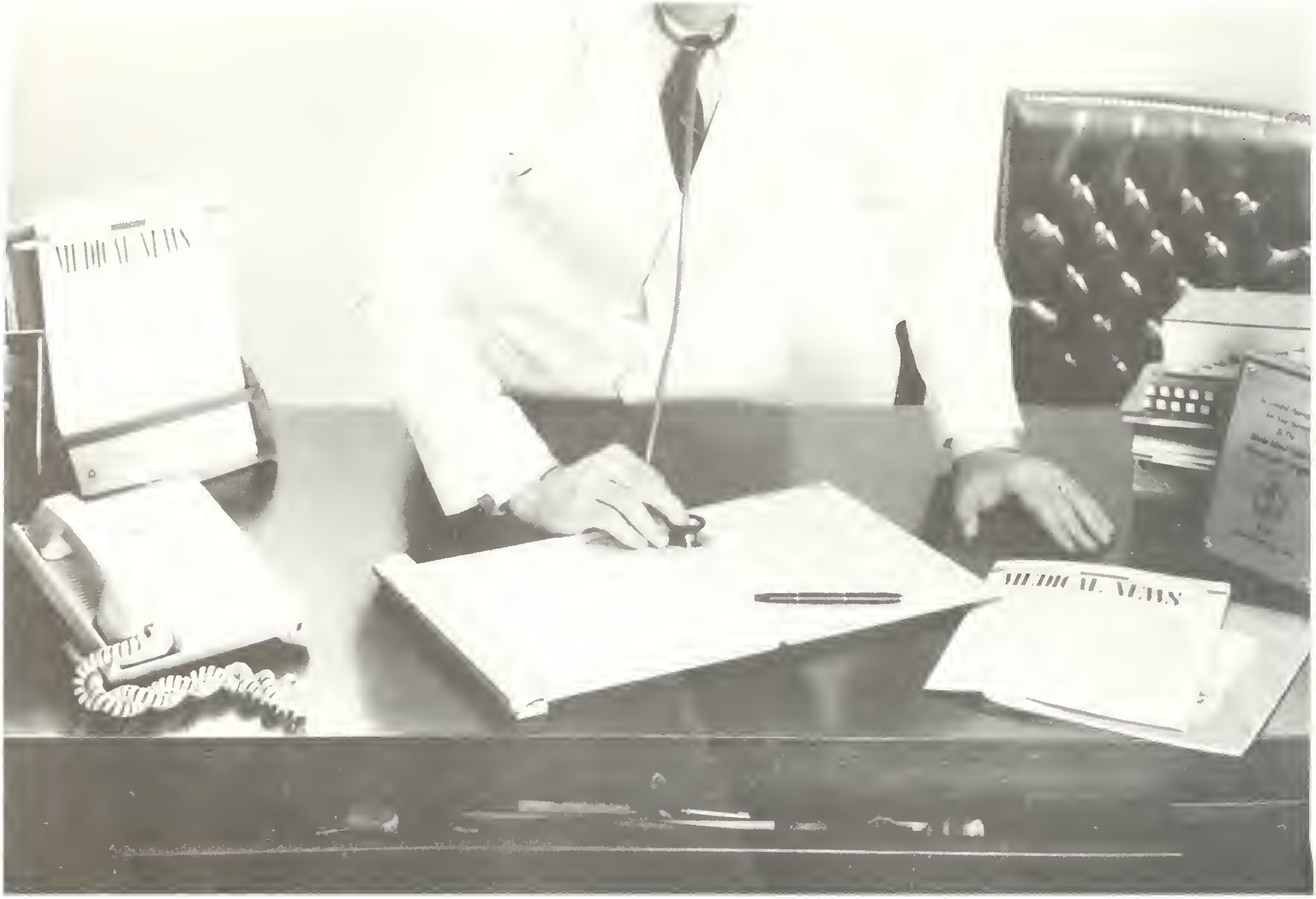

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The President Has Been Shot. Herbert L. Abrams, MD. 363 p. New York & London: WW Norton & Co, 1992. $22.95

Would you like to read a hard-to-put-down whodunit, where you know at the outset who did, but which still leaves vital questions unanswered? A thriller written by a socially conscious physician, raising most serious concerns about matters of national safety, related to the health and the psychological reactions of public officials at the highest level of government?

Herbert L. Abrams, MD, former chairman of the Department of Radiology at Harvard and now with the Stanford University School of Medicine and the Stanford Center for International Security and Arms Control, is the physician who wrote this book that's readable, yet researched with meticulous scholarship. It leaves you well-informed, and perturbed about the frailty, sometimes the folly, of human behavior on which, literally, the fate of the whole world may depend at any given time.

On the afternoon of March 30, 1981, a disturbed and confused young man named John W. Hinckley, Jr, in an interval of hyperalert lucidity, managed to slip through the elaborate security net surrounding the Washington Hilton on the occasion of a visit by President Reagan, and to position himself among the photojournalists. His .22 caliber pistol pointed the same way as their camera lenses. By the time he had emptied the chamber three people lay wounded on the ground and the president, not yet realizing he had been shot, lay sheltered on the floor of his limousine, already speeding away.

The theme of the book is the reaction of Ronald Reagan, the human being, to the attack, to the ensuing surgery (described with absorbing expertise), and to its aftermath, as it reflected on the reaction of the governmental machinery, only into the 70th day of the new presidency. The complexity of the issue unfolds through 300 riveting pages, defying simplification. In short, though, it deals with the transfer of power in case of a president's disability or inability to perform his functions. (Both these terms, already, beg the first question: how disabled or unable to do what?)

With a historian's perspective, Dr Abrams reviews all previous instances of presidential disability and the many attempts at finding an answer. They culminated in years of laboriously drafting the 25th Amendment to the Constitution, promulgated in 1967. It lays the determining conditions out in some detail and establishes a clear line of succession. Since no document can possibly take all unpredictable circumstances into account, Congress, the American Bar Association and others have been working on refinements ever since, none of which, however, have been codified. Dr Abrams adds many pertinent suggestions.

In the instance of the 1981 assassination attempt, the spunk and the resilience of the oldest president in the history of the United States contributed to an underestimation of the actual functional damage done. The courage and presence of mind of a man who says to his worried wife, "Honey, I forgot to duck" and asks the surgical team to "Please tell me you are all Republicans" before being put under anesthesia, did not meaningfully predict the considerable post-operative impairment.

Unlike the first-rate, split-second, coordinated and lifesaving medical intervention, however, confusion and agitation prevailed in the actions and inactions of the totally unprepared presidential staff and of the cabinet. Vice President Bush, flying into town from a distance of more than 2 hours, was not being consulted. Competing power groups clamored that they were in charge (eg, Alexander Haig), communication all but broke down, and the White House counsel's attempt to activate the 25th Amendment was dismissed out of hand by staff. At a moment when there was a serious possibility that the Soviets were about to invade Poland, the competing inner circles, reluctant to give up their influence, tried to project an image of "normality." As Nancy Reagan put it: "There was kind of an unspoken agreement that none of us would let the public know how close we came to losing him," – the bullet having stopped 1 inch behind the heart and the aorta.

In the meantime an albeit vigorous 70-year-old man, under the impact of analgesic narcotics, was beginning to recover from major surgery, survival still in doubt, energy, cognitive and emotional functions appropriately diminished. Yet, an appearance of business as usual was being maintained throughout, papers "signed," "decisions" made. And the Polish government had sense enough to do what was necessary to avoid being invaded.

There is a silver lining to this cautionary tale. Collective wisdom prevailed when the Amendment was implemented in 1984 and 1985 on the two occasions of President Reagan's abdominal surgery. The present administration appears to have specific contingency plans in place. Yet, the value of this book lies in pointing out how much constant vigilance is needed to preserve a government of laws, given the relentless onslaught of personal and political ambitions. And that, all precautions notwithstanding, our fate hangs on an awfully thin thread.

Hugo Taussig, MD

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Barbara A. DeBuono, MD, MPH
Director of Health

Obesity in Rhode Island

The health risks associated with overweight have been well established and include elevated serum cholesterol levels, elevated blood pressure, non-insulin-dependent diabetes, coronary heart disease, gallbladder disease, some types of cancer, and osteoarthritis of the weight-bearing joints. Obesity has been defined by the National Institutes of Health as "an excess of body fat frequently resulting in a significant impairment of health."[1] In this report an individual is determined to be obese (or, equivalently, overweight) if his or her Body Mass Index (BMI, calculated as weight measured in kilograms divided by the square of height measured in meters) equals or surpasses the age-sex specific cutoffs used with the Year 2000 National Health Objectives.[2]

Estimates of the prevalence of obesity among Rhode Islanders age 12 and older are available from the Rhode Island Department of Health's statewide Health Interview Survey, conducted in 1990, which collected information by telephone on 6,536 individuals in 2,588 randomly selected households. Height and weight were among the data items solicited for each household member. Based on the calculated BMI, the prevalence of obesity among Rhode Islanders ages 18 and older is 20 percent, or approximately 154,000 individuals. The survey data also indicate that 13 percent of those ages 12 to 17 years are overweight. In comparison, the 1990 National Health Interview Survey indicated that 26 percent of adult Americans were overweight, based on self-reported weight and height.[3]

The prevalence of obesity varies considerably with age and sex among Rhode Islanders. The pattern by age (Fig. 1) is similar to that seen for the US population as a whole, in which overweight increases with advancing age and then declines. In Rhode Island the percentage of overweight individuals increases from low levels among those under 25 years of age to a peak among those aged 55-64, then decreases among the elderly. The most striking difference between males and females is seen in the patterns of prevalence by age (Fig. 2). Among females the prevalence of overweight is low up to age 34, then increases consistently through the age group 65-74. Males, by contrast, show a dramatic increase in prevalence in early adulthood, and then a leveling off before prevalence declines among those 65 and older.

Data from the Rhode Island survey mirror national findings that "overweight is particularly prevalent in (some) minority populations."[2] In Rhode Island the highest proportion of overweight occurs among blacks (28%) and white Hispanics (26%), while other minorities, including Asians and American Indians, have the lowest prevalence of overweight (14%) (Fig. 3). Twenty percent of white non-Hispanics are overweight.

With one out of five adults overweight, and therefore facing increased risk for obesity-related diseases, the state faces a major public health challenge. The high prevalence of overweight among younger adult males is cause for particular concern since obesity poses greater risk for individuals under the age of 50 and when it is of extended duration. Likewise, the higher prevalence of overweight among Rhode Island's black and Hispanic populations must be addressed, as these groups have elevated morbidity and mortality from a broad range of chronic diseases.

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Submitted by the Office of Health Statistics, Jana E. Hesser, PhD, and Jay S. Buechner, PhD, Chief. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD.*

Fig. 1 – Percent of Population Overweight by Age Group, Rhode Island 1990

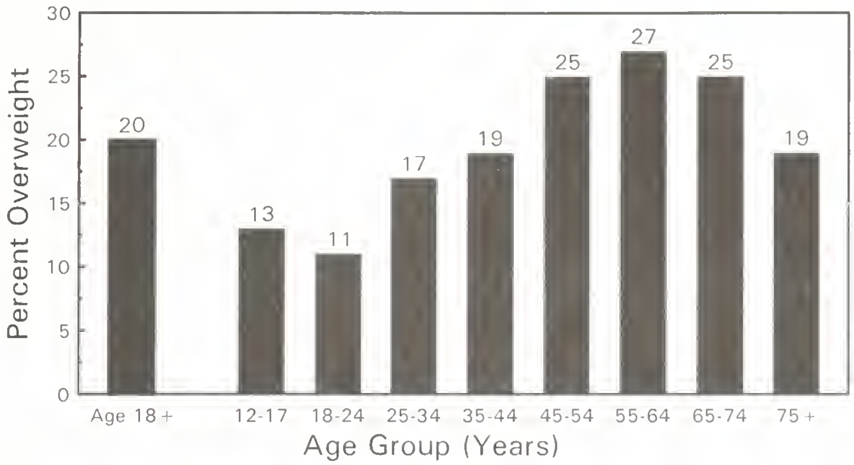


Fig. 2 – Percent of Population Overweight by Age Group and Sex, Rhode Island, 1990

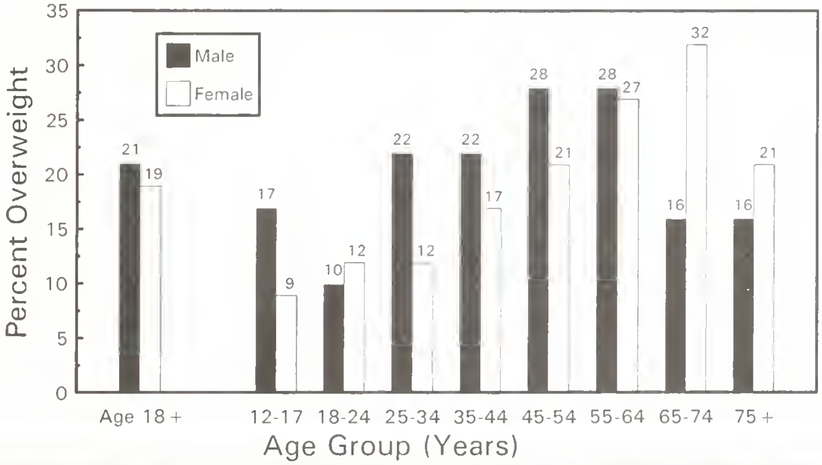
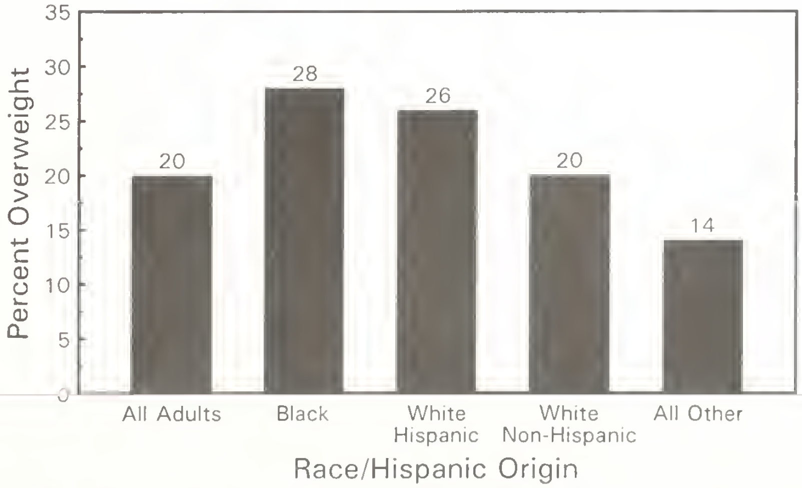


Fig. 3 –Percent of Population Overweight by Race and Hispanic Origin, Ages 18 Years and Older, Rhode Island, 1990



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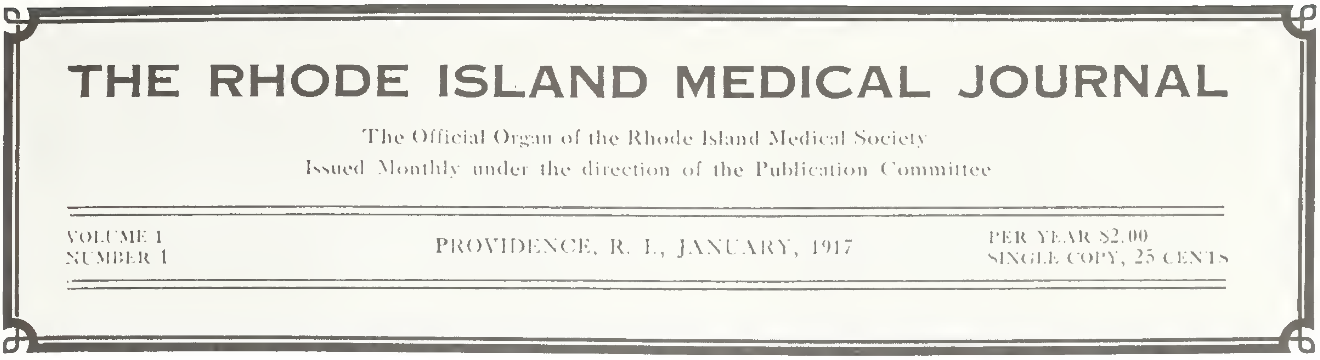

THE RHODE ISLAND MEDICAL JOURNAL

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

Ninety Years Ago
(October, 1902)

The remarks of Professor Hermon Bumpus are printed, representing his speech entitled "The Trade and the Profession," presented to the Rhode Island Medical Society during its 1902 Annual Meeting. Professor Bumpus first lists the characteristics distinguishing a trade from a profession. He states: "In adopting a professional career, we must take care that the professionalism is real and not fictitious. Haste to get into practice for pecuniary or social gain is commercial, not professional. It is the prostitution of a profession. I beg of you, therefore, in the name of the science you represent, to encourage young men to enter your domain deliberately with splendid equipment, with the spirit of research, and with no feeling that they must acquire merely to retail at a profit, but rather that they must acquire that they may contribute back again to the profession. Many medical schools are at fault in their indifference to the early obligations of the physician to his profession, and as a result of the neglect the young physician postpones the period of scientific investigation until his contribution may be based upon his personal clinical experience. When he finally has the clinical experience he discovers that he is overwhelmed with business, and for the remainder of his days he retails over and over again the goods acquired in his youth. His microscope becomes a mere ornament to his office, and his medical library grows, like a great tumor, but performs no function."

Bumpus concludes: "Is the present code of professional etiquette, about which I know too little, designed to protect the financial interests of the physician or to promote the profession at large? If it is designed to protect the interest of the individual, then the profession of medicine must suffer, for Science is pledged to no one. It is no respecter of age or person; it tolerates no restrictions; it cares nothing for social prestige; it admits no law of priority; it detects fiction; it despises selfishness; it detests hypocrisy. Generosity is its path, cordial cooperation is its companion, and truth is its goal."

Henry B. Potter, MD, describes his experiences in the treatment of thyroid perforation at Rhode Island Hospital. In the decade ending in 1902, the hospital treated 534 cases of typhoid fever, 68 dying (a mortality rate of 12.2%). During this same interval, there were 10 recognized cases of perforation secondary to typhoid infection. Typically, the perforation occurs during the third week of the disease. Potter quotes Osler who noted that intestinal perforation accounts for about 30% of typhoid mortality. Potter then proceeds to discuss the imperative nature of surgical intervention – "the earlier the better." The surgical procedure, which at this time carries a mortality rate of about 60%, is best accomplished with an initial incision over McBurney's point. Potter concludes: "Undoubtedly the most reliable signs (of perforation) are the sudden, continued abdominal pain, tenderness and rigidity, and leucocytosis. The diagnosis once made, no time should be lost before operation, no matter what the condition of the patient." The author also summarizes recent studies on the diagnostic reliability of white blood cell counting by a surgeon named Harvey Cushing.

Fifty Years Ago
(October, 1942)

The lead article, entitled "The Medical Examiner System in Rhode Island," is written by Alan R. Mortiz, MD, professor of Legal Medicine at Harvard. The author first discusses the essential public services of which a medical examiners' office is to be held accountable. These include: 1) that deaths from homicide will not escape recognition; 2) that all pertinent medical evidence bearing on the circumstances and manner in which deaths by homicide have occurred will be obtained; and 3) that deaths that have resulted from preventable hazards to public health will be investigated.

Mortiz concludes: "At present the laws of Rhode Island require the appointment of 31 medical examiners and 3 associate medical examiners. This would indicate that there is in the neighborhood of one examiner for each 21,000 inhabitants. The death rate in New England is approximately 11 per

1,000 so that the average number of deaths per medical examiner's jurisdiction in Rhode Island is probably in the vicinity of 230 per year. If the medical examiners restrict their investigations to deaths of persons supposed to have died of violence the average number of investigations per medical examiner should be about 23. It can be assumed that the greater the experience of any individual medical examiner and the more frequently he is called upon to conduct medico-legal investigation, the more likely he is to be proficient in his work. This being the case, it would appear that the medical examiner service of Rhode Island would be discharged more effectively if there were fewer medical examiners. In communities in which medical examiners serve on a full-time basis it has been found that one examiner per 200,000 is required. Four full-time examiners could in all probability provide adequate service for the state of Rhode Island. One full-time medical examiner's pathologist and 10 part-time county or district examiners could undoubtedly provide a more efficient and less expensive service than is now available."

Russel O. Bowman, PhD, discusses fluid administration, body water, water balance, acid-base balance, internal osmotic pressure and the rational use of therapeutic fluids in various disease states. The author establishes certain basic rules for fluid administration including: The uncomplicated case requires parenteral daily administration of 1,000 cc of isotonic saline and 1,500 cc of isotonic dextrose in water. Hypertonic solutions should be used exclusively to relieve pulmonary or cerebral edema. Plasma should be employed for the prevention of shock. Fluids should be given by mouth, by rectum and by clysis whenever this can be done; and finally, more important than the decision to give fluids, is the decision of what kind of fluid to be given and how much to give.

The leading editorial considers the reluctance of Rhode Islanders to heat their homes during the winter at temperatures lower than 75 degrees. Government restrictions on household fuels demands that Americans in this the 10th month of World War II abide by measures for fuel conservation . A temperature of 65 degrees is recommended, supplemented by some warm underclothing.

Twenty-Five Years Ago
(October, 1967)

The 24th annual Charles V. Chapin Oration is given by Louis Weinstein, PhD, MD, of Tufts University. The title of his scholarly tract is "Clinical Precision in the Use of Antimicrobial Agents," He notes, " . . . even in the absence of microbiological proof of the identity of an organism and its sensitivity to various antimicrobial agents, the chemotherapy of infection can often be very rational and seldom need be empiric. The frustration of the physician faced by a microbiologically undefined infection and his attempt to alleviate this by more or less arbitrary administration of one or more antibiotics are frequently unwarranted.

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Congressman Durwall G. Hall, a practicing physician from Missouri, provides the *Journal* with a statement summarizing his views concerning the prescribing of generic drugs. He believes that the regarding of all drugs as alike both in composition and potency is a myth, and after citing examples of differences in action, recommends that the practicing physician should avoid the use of generic preparations and prescribe drugs from the established pharmaceutical companies.

Drs Burgess, Organic, Peterson and Burnight consider the research potentials in studies of Rhode Island's medical care systems, noting particularly the characteristics that make this state special.

Editorials explore a wide variety of diverse subjects including the destructive riots in Newark and Detroit, offering some sane advice; the problems of generic equivalency in prescribing; the restoration of the Hebrew University Hospital on Mount Scopus, in Jerusalem after the recent war; the expanding knowledge regarding heart attacks; biomedical engineering; and pancreatic grafts and diabetes.

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References:

1. A. Morales et al., New England Journal of Medicine: 1221. November 12, 1981.
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p. 176-188. McMillan December Rev. 1/85.
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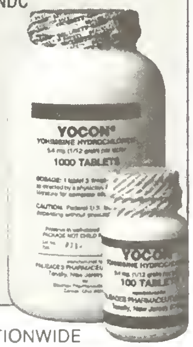

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Abbreviations: *Rhode Island Medicine* attempts to avoid the use of jargon and abbreviations. All abbreviations, especially of laboratory and diagnostic procedures, must be identified in the text.

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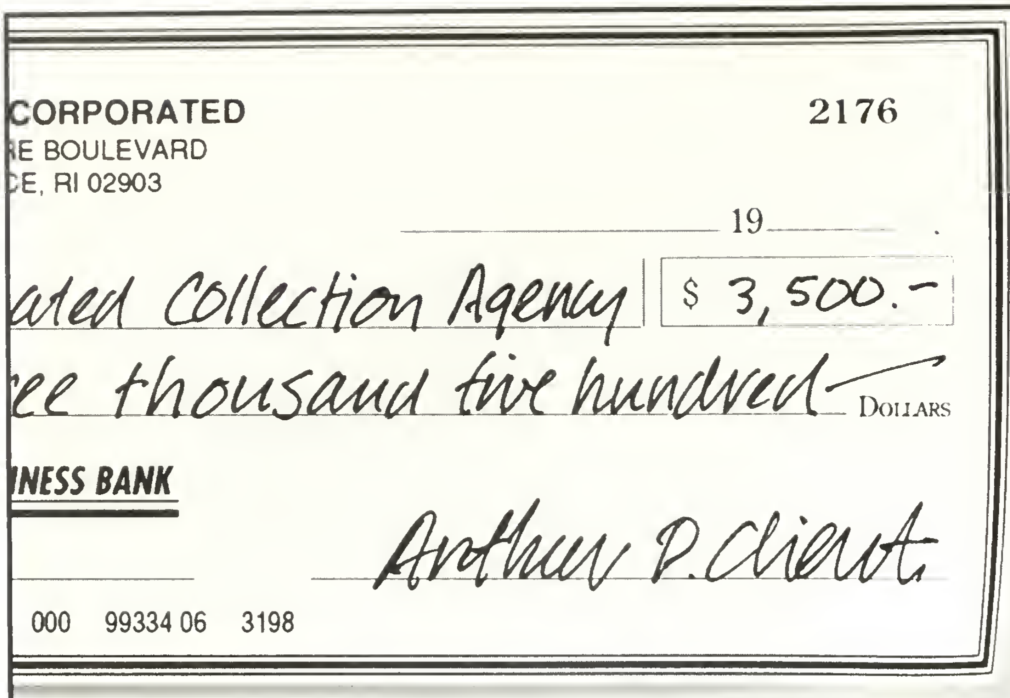

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Cover: Roman statue depicting Aesculapius and his daughter, Hygeia.

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COMMENTARIES

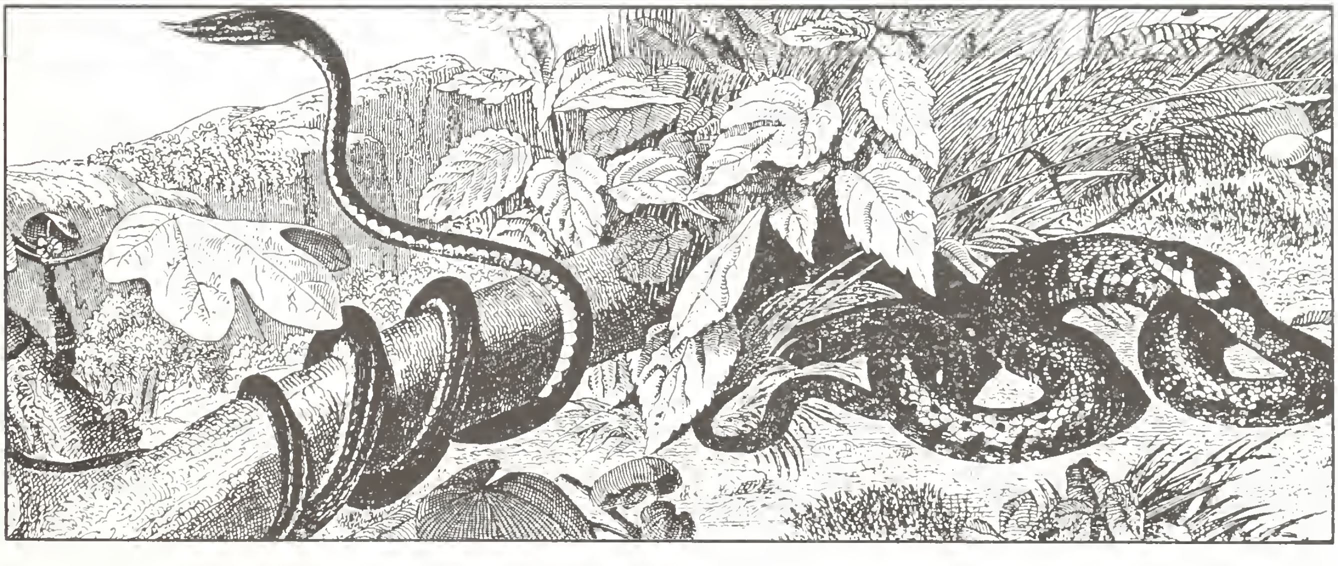
One Snake or Two?

The Hippocratic Oath begins with a solemn homage to a small battalion of Greek divinities. "I swear by Apollo the Physician, by Asclepius, by Hygeia, by Panacea, and by all the gods and goddesses, making them my witnesses." Who were these named deities to deserve the special allegiance and respect of three millennia of physicians?

The first listed is Apollo, one of the more powerful of Olympian gods and son of Zeus and Leto. Apollo had been assigned a broad range of supervisory authorities. He was said to have jurisdiction over prophecy, the victories of great warriors, the bucolic pursuits, particularly the care of flocks of sheep, poetry and music, sunlight, archery – and medicine. Given all of these diverse chores, it was thus understandable that the Oath specify which of Apollo's many vocations should receive this enduring expression of fealty (ie, Apollo *cum* physician). When Apollo had been a youth he seized the oracular shrine of Delphi by slaying its custodian, the awesome snake called Python (hence, Python as the alternate name of the Delphic shrine). The shrine became the site of purification, the healing of troubled souls and the renewal of health of those chronically ill. Apollo's direct role in healing, while pervasive, remained remote. In Epirus, the shrines of Apollo were frequently centered in groves of trees harboring colonies of holy snakes.

The union of Apollo and the nymph Coronis produced a son called Asclepius, born in Epidaurus, in Argolis. Asclepius was educated by the centaur Cheiron, learning the arts of hunting and medicine (in the early days of the Doric faith, it was customary for each god to be burdened with many unrelated responsibilities).

After Perseus had beheaded Medusa (she with the coiffure of many serpents) Athene directs Asclepius to extract blood from her headless body. Blood from her left side was lethal to the touch, while blood secured from Medusa's right side possessed unique powers to resurrect the dead. (Again, the paradox of the two faces of a god, one nurturing and one destroying.) With these new therapeutic resources, Asclepius now achieved notable clinical successes. Zeus, fearing that Asclepius might make all men immortal, slew him with a thunderbolt. Before his death, however, Asclepius is said to have sired six children including two sons, Podalirius and Machaon, both of whom were physicians to the Greek armies besieging Troy (Iliad II, 645-8). The careers, or at least the reputations, of his four daughters (Hygeia, Panacea, Iaso, and Aegle) were more durable.



The Asclepian worship initially was centered in Epidaurus but later spread throughout Greece. The typical temple site was on a mountain side near a stream. Therapy consisted of rigorous diet, purgatives, ablutions and rest. Votive tablets, animal sacrifices and overnight stays (*incubatios*) were customary.

The cult of Asclepius was transplanted to Rome during its plague of 293 BC. These new Roman shrines were rendered authentic by the importing of snakes from the original Epidaurean temple. Aesculapius (the Latinized spelling of Asclepius) was now pictured as an aging, bearded male in a flowing robe bearing a staff with a single, coiled snake. He was characteristically accompanied by his daughter, Hygeia (see cover illustration), and by Telesphorus, the boy physician.

The cult of Hygeia was also Epidaurean in origin, although rising centuries after the Asclepian sect had been established. Hygeia's genealogy was at first obscure. But when the two cults were fused sometime around 400 BC, Hygeia was belatedly made the daughter of Asclepius. Indeed, in some Orphic hymns, she is identified as his wife. Hygeia also was transfigured to the Roman pantheon, now called Valetudo, and sometimes was identified with the Roman god Salus. She was depicted as a young maiden dressed in the classical Doric chiton, giving nourishment to a serpent. Hygiene, the science, is concerned with the preservation of health and the prevention of sickness, rather than with therapy for illnesses. Its aim in classical times was, "Growth more perfect, decay less rapid, life more vigorous, death more remote."

Panacea, sister to Hygeia and another alleged daughter of Asclepius, was assigned the supervision of curative, rather than preventive, medicine.

Another son of Zeus was Hermes who functioned primarily as a messenger to the Athenian gods. As with all of his divine colleagues, he bore added chores: he was simultaneously patron god of travelers, of merchants, of oratory, and of thieves. He was depicted as an athletic youth with wings upon his sandals, his hat and his staff – a rod entwined with two symmetrically disposed serpents. This staff of Hermes had been a gift from Apollo, and was emblematic of the messenger, and later a symbol of neutrality, thus carried by all ambassadors. Hermes is said to have taken this wand made of olive wood and intervened between two fighting serpents, resolved their differences and incorporated the two intertwined about his wand. When the Greek Hermes was absorbed by the Romans – and transformed then into Mercury – the winged staff came to be called *caduceus* and variously symbolized witness, neutrality, arbitration and regeneration. This herald's wand, the caduceus, also had magical properties, transforming base metals into gold. Thus the caduceus did not spring to life from the lapel emblem of an army physician; rather, it had a long, utilitarian history as a symbol of various non-medical professions and enterprises well before its marginal association with the healing arts. It was the caducean attribute of regeneration that prompted the 19th century British Army Medical Corps to adopt it as its emblem. At the turn of this century, the US Army Medical Corps also selected a stylized caduceus as its symbol.

Purists have maintained that the double-snaked caduceus is not a legitimate representation of medicine and have urged therefore that the profession restrict its symbols to the Asclepian rod with a single snake.

But why all these snakes, whether it be a single one around the rod of Asclepius or two around the staff of Hermes? Certainly in more recent centuries we have endowed the snake with a reptilian spectrum of demeaning qualities: craftiness, sorcery, venality, speaking with forked tongues, and just plain evil. In classical Occidental and oriental cosmologies, myths and rituals, on the other hand, the snake was more an animal of wonderment, a representative of the underworld gods and a symbol of eternal life. The Babylonian Gilgamesh, for example, sought the plant of immortality from the ocean floor but when returning to shore lost it to a serpent who devoured it – and was thus able to be reborn again and again after each shedding of its skin.

In Elamite culture, the tree of life is entwined by a great snake. In Genesis, the first animal named is the snake, and is made guardian of the tree of knowledge, similar indeed to the tree of the Greek Hesperides, with its golden apples of wisdom, also with a trunk guarded by an enormous serpent. Esmun is the protosemitic god of healing and is portrayed holding a rod wrapped with two serpents. And in Egypt, too, ". . . they cast down every man his rod, and they became serpents; but Aaron's rod swallowed up their rods." (Exodus 7:12)

In so many of the pagan mysteries, then, the snake was symbolic of renewal and rebirth, and an object both of fear and veneration. Anthropologists have suggested that the snake, in its association with rebirth, is but a phallic representation; but in the immortal words of Sigmund Freud, a cigar is sometimes just a cigar. The glistening snake arising from the remnants of its shedded skin was sufficient miracle in the eyes of primitives to adopt it as their near-universal symbol of growth, rebirth, renewed health – and even immortality.

Stanley M. Aronson, MD

The Language of Epidemiology (XIV): Case Control Studies

Concepts of cause – sometimes called etiology – often are based upon a microbiological scenario. A disease with novel clinical characteristics is defined; some of these novel features suggest that it is caused by a transmissible living agent, and a search for a causative organism is undertaken. The same organism is isolated repeatedly from patients with this new disorder; this particular organism generally is not encountered in patients without the disease; the organism causes a similar disease in experimental animals, and it is then proclaimed as the *cause* of the illness under study.

Most of the acute, infectious disorders of humanity have been exhaustively studied and their causative agents determined. We are left, then, with large numbers of chronic disorders – arthritis, multiple sclerosis, diabetes, immune disorders, various cancers to name but a few – where the rules of simplistic causality are fruitless. Yet we search for cause, suspecting somehow that some risk factor(s) in the distant past (perhaps even an infectious agent), encountered by a person with certain genetic attributes, may have been instrumental in causing this disease (or more likely, increasing the probability that it would arise).

What methodologies may be employed in elucidating causative agents in such chronic disorders? When causative agents are separated from their medical consequences by years or even decades it is patently unlikely that mere inspection of the facts will identify the agent. Resorting to facts alone is the refuge of the unimaginative. We must have a wild guess, a hypothesis – no matter how tenuous – to test.

We begin, then, with an intuitive suspicion that exposure to factor Z during childhood culminates, decades later, in disease X. We then assemble a statistically sufficient number of proven cases of disease X as well as a parallel (control) group of persons who in all practical ways are similar to those persons with disease X (ie, in age, gender, etc.) but who are free of the disease.

Then, by means of history-taking or rigorous review of prior medical records, we ascertain the frequency of exposure to factor Z in (1) the assembled cases, and (2) in the assembled control group. This retrospective excursion is called a case-control study.

Our specific interest lies in determining whether there is a difference in frequencies of exposure (to factor Z) between the case and the control populations. This epidemiologic measure is called the odds ratio. The closer the association between factor Z and disease X, the higher will be the ratio. On the other hand, a total lack of association (eg, between a failing grade in spelling while in elementary school and esophageal cancer in adulthood) would result in an odds ratio of 1.0.

How, specifically, is the odds ratio arrived at? The following four values are first determined:

Number of disease X patients exposed to factor Z = A
Number of disease X patients not exposed to factor Z = C
Number of controls exposed to factor Z = B
Number of controls not exposed to factor Z = D
Odds Ratio = AD/BC

Case control studies are a commonly employed method in clinical epidemiology (used in about one-third of all currently published medical articles). The method is quick and inexpensive, often entailing nothing more than a meticulous review of older medical charts. The method is of particular value in diseases that are relatively rare and where the measured interval between exposure and the emergence of clinical disease is lengthy.

The case control study technique, while widely employed, is nevertheless a suboptimal method of arriving at the etiology of obscure, chronic diseases. Successful use of this method requires a full awareness of the many biases that might generate invalid results. These biases will be discussed in a future column.

Stanley M. Aronson, MD

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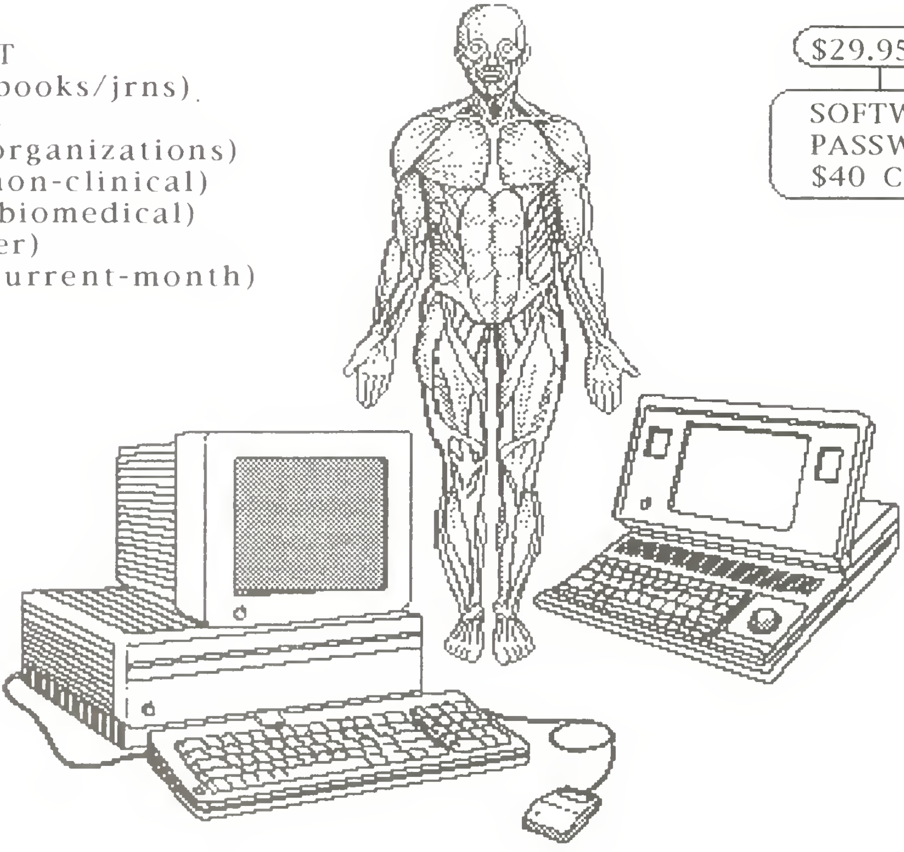

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Completeness of Cancer Registration in Rhode Island: An Evaluation of Early Data

John P. Fulton, PhD
Dorothy M. Stanis, AS
Jay S. Buechner, PhD

Statistically significant deficits in observed cancer incidence rates were found for both sexes in Rhode Island in 1987-1988, especially for prostate cancer, melanoma and oral/pharyngeal cancers among males and for breast cancer among females.

Rhode Island's reported cancer incidence is low in relation to its cancer mortality. In 1987, for example, Rhode Island's age-adjusted incidence-to-mortality ratio for all male cancers was 1.94.[1] The comparable ratio for the United States was 2.07.[2] This observation is not new. When first publicized in 1984,[3] it stimulated considerable discussion among Rhode Island's cancer control professionals. Alternative hypotheses were formulated to explain the phenomenon, based on different assumptions. If Rhode Island's incidence-to-mortality ratio were assumed to be accurate, its case fatality appeared high, implying problems with medical care. If Rhode Island's case fatality were assumed to be average, its incidence-to-mortality ratio appeared low, implying problems with cancer registration.

To explore the possibility that newly diagnosed cancers are being undercounted in Rhode Island, cause-specific cancer incidence rates were analyzed in reference to US data, identifying apparent cause-specific deficits. On the basis of the comparisons and current literature, it was possible to estimate the completeness of cancer registration in Rhode Island and plan further steps to evaluate the registration system.

Methods

The evaluation of cancer incidence proceeded in two parts. A primary analysis was undertaken to identify deficits in cause-specific incidence for white males and white females. Based on these findings, a secondary analysis was undertaken to explore underreporting and estimate the completeness of registration in Rhode Island.

Primary Analysis

Average annual age-sex-race-cause-specific cancer incidence rates and comparable mortality rates were computed for whites in Rhode Island, from 1987 to 1988, from counts of newly-diagnosed cancers reported to the Rhode Island Cancer Registry and estimates of the Rhode Island population produced by the Office of Planning, Rhode Island Department of Administration. (Rhode Island incidence data were available through 1990, but Rhode Island mortality data were available only through 1988, and US incidence data were available only through 1987.) These rates were weighted with the US standard million population of 1970 to produce average annual sex-race-cause-specific cancer incidence rates ("observed Rhode Island incidence") and comparable mortality rates ("observed Rhode Island mortality") for whites, using methods defined by the National Cancer Institute (NCI).[4] Too few newly diagnosed cases of cancer had been reported for blacks, native Americans, or Asians in the two years, 1987 and 1988, to compute meaningful incidence rates for these groups.

Average annual ratios of age-adjusted sex-race-cause-specific cancer incidence rates to comparable mortality rates were computed for whites in the US, 1983-1987 (US cancer ratios).[2] Trends in US cancer ratios were explored in two ways to ascertain their stability. First, ratios for all cancers combined, by sex, were graphed to facilitate a visual inspection of trends. Then, cause-specific ratios were computed, by sex, for each of the five years, 1983-1987. These ratios were used to compute five-year means, $\underline{X}$, standard deviations, $\underline{s}$, and coefficients of variation, $\underline{V}$, where $V=s/X$, for each cause, by sex. (The coefficient of variation is a measure of the relative dispersion observed in a variable.)

Observed Rhode Island mortality rates were multiplied by US cancer

ABBREVIATIONS USED:

CIS: Cancer Information System, Hospital Association of Rhode Island
NCI: National Cancer Institute
SEER: Surveillance, Epidemiology and End Results

John P. Fulton, PhD, is administrator of the Rhode Island Cancer Registry, Rhode Island Department of Health, and clinical assistant professor of Community Health at Brown University, Providence, Rhode Island. Dorothy M. Stanis, AS, is director of the Cancer Information System, the Hospital Association of Rhode Island. Jay S. Buechner, PhD, is chief of the Office of Health Statistics, and clinical assistant professor of Community Health at Brown University, Providence, RI.

Table 1 – Difference between observed and expected age-adjusted cancer incidence, resident Rhode Island white males, 1987-1988, by anatomical site

Anatomical Site	Ratio of Incidence to Mortality in the US (1)	Mortality in RI (2)	Expected Incidence in RI {(1) x (2)] (3)	Observed Incidence in Rhode Island (4)	Difference between Observed and Expected Incidence in RI [(4)-(3)] (5)
Oral/pharynx	3.7	6.5	24.2	17.4	–6.8*
Esophagus	1.1	5.3	5.7	6.3	0.6
Stomach	1.6	8.9	14.0	12.6	–1.4
Colon/rectum	2.5	30.7	76.0	73.8	–2.2
Liver	1.0	2.9	2.8	2.5	–0.3
Pancreas	1.1	9.3	10.2	10.1	–0.1
Larynx	3.5	3.9	13.8	10.3	–3.5
Lung	1.1	71.5	81.7	83.7	2.0
Melanoma	3.9	5.4	20.9	10.2	–10.7
Male breast	3.3	0.1	0.3	0.7	0.4
Prostate	4.0	22.4	89.9	68.8	–21.1
Testis	14.6	0.3	4.4	4.3	–0.1
Bladder	5.2	6.6	34.1	35.9	1.8
Kidney	2.4	4.8	11.6	13.6	2.0
Brain & n.s.	1.5	6.5	9.6	9.2	–0.4
Thyroid	8.2	0.5	4.1	1.7	–2.4*
Hodgkin's	3.9	1.2	4.7	5.0	0.3
N.H. lymph	2.2	7.1	15.9	14.6	–1.3
Myeloma	1.5	2.5	3.7	3.9	0.2
Leukemia	1.6	7.2	11.2	11.4	0.2
Other sites	1.4	19.9	28.2	40.8	12.6*
All Sites	2.0	223.5	449.0	436.8	–12.2

*Difference is statistically significant at the p<0.05 level, two-tailed test.

Note: All rates have been age-adjusted using the 1970 population of the US as the standard population. All rates are expressed as events per 100,000 population.

Source: RI–Rhode Island Cancer Registry. US – Gloeckler-Ries, LA, Hankey BF, Edwards BK (Eds.): *Cancer Statistics Review*, 1973-1987. NIH Pub. No. 90-2789. Bethesda, Maryland: National Cancer Institute, 1990.

Table 2 – Difference between observed and expected age-adjusted cancer incidence, resident Rhode Island white females, 1987-1988, by anatomical site

Anatomical Site	Ratio of Incidence to Mortality in the US (1)	Mortality in RI (2)	Expected Incidence in RI {(1) x (2)] (3)	Observed Incidence in Rhode Island (4)	Difference between Observed and Expected Incidence in RI [(4)-(3)] (5)
Oral/pharynx	3.8	1.9	7.2	4.9	–2.3*
Esophagus	1.3	1.4	1.8	1.3	–0.5
Stomach	1.5	3.7	5.7	6.0	0.3
Colon/rectum	2.5	18.6	47.0	45.5	–1.5
Liver	0.9	1.2	1.0	1.3	0.3
Pancreas	1.1	6.8	7.8	6.9	–0.9
Larynx	3.8	0.8	3.0	2.3	–0.7
Lung	1.4	30.5	41.7	37.2	–4.5
Melanoma	5.6	1.2	6.8	6.9	0.1
Breast	3.9	30.1	116.0	106.0	–10.0*
Cervix	2.9	2.6	7.5	7.4	–0.1
Uterus	6.6	3.4	22.4	21.3	–1.1
Ovary	1.8	7.5	13.5	13.7	0.2
Bladder	4.5	1.7	7.7	9.0	1.3
Kidney	2.4	2.8	6.8	7.1	0.3
Brain & n.s.	1.6	4.4	6.8	6.1	–0.7
Thyroid	15.0	0.1	1.5	4.8	3.3*
Hodgkin's	5.0	0.3	1.5	3.6	2.1*
N.H. lymph	2.2	5.1	11.3	11.4	0.1
Myeloma	1.5	2.7	3.9	2.8	–1.1
Leukemia	1.5	3.3	5.1	7.4	2.3*
Other sites	1.5	17.6	25.9	28.2	2.3
All Sites	2.4	147.7	359.0	341.1	–17.9

*Difference is statistically sginificant at the p<0.05 level, two-tailed test.

Note: All rates have been age-adjusted using the 1970 population of the US as the standard population. All rates are expressed as events per 100,000 population.

Source: RI–Rhode Island Cancer Registry. US – Gloeckler-Ries, LA, Hankey BF, Edwards BK (Eds.): *Cancer Statistics Review*, 1973-1987. NIH Pub. No. 90-2789. Bethesda, Maryland: National Cancer Institute, 1990.

ratios to produce estimated Rhode Island incidence rates, 1987-1988. These estimates were compared with observed Rhode Island incidence rates (Tables 1 and 2), by computing the difference between them. The statistical significance of each difference was tested at the $p<0.05$ probability level using Keyfitz's technique for computing the "sampling variance of standardized mortality rates."[5]

Secondary Analysis

The percentage of newly diagnosed cancers of the prostate and female breast, which were reported from different sources, were obtained for Connecticut, 1975 to 1979,[6] and Rhode Island, 1987 to 1988, compared, and evaluated (Table 3). From these data and the differences found between estimated and observed Rhode Island incidence rates (Tables 1 and 2), alternate estimates of the completeness of cancer registration in Rhode Island were constructed (Table 4).

Results of Primary Analysis

Available US cancer ratios for whites, by sex, have been plotted in Figure 1, demonstrating their stability over time. Ratios for both sexes show a slight increase between 1973 and 1987 with inconsequential variations from year to year. Considerable stability also was observed among cause-specific ratios for the years 1983 to 1987. The average coefficient of variations is 0.06 among cause-specific ratios for males, 0.05 among cause-specific ratios for females. The stability of these ratios assure meaningful estimates of Rhode Island incidence rates.

Statistically significant deficits in observed cancer incidence rates were found for both sexes in Rhode Island, from 1987 to 1988, about 12 per 100,000 for white males (Table 1) and about 18 per 100,000 for white females (Table 2). Among males, deficits were especially large for prostate cancer (21 per 100,000), melanoma (11 per 100,000), and oral/pharyngeal cancers (7 per 100,000). Among females, a large deficit was found for breast cancer (10 per 100,000). A few smaller cause-specific deficits were found, as well as a few small surpluses.

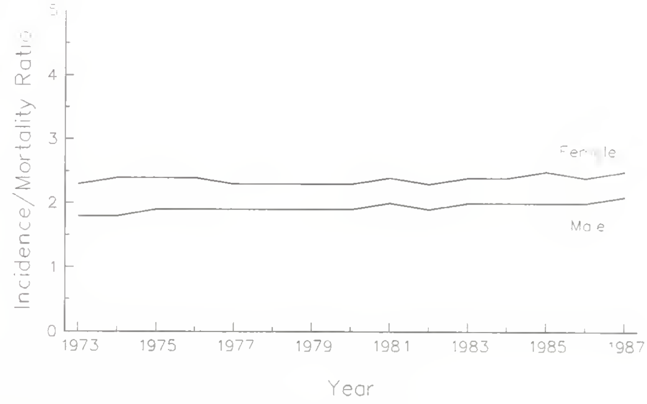
Discussion and Results of Secondary Analysis

The apparent deficits in observed melanomas and oral-pharyngeal cancers are not unexpected. Both forms of cancer, if detected early enough, may be treated successfully in outpatient settings not easily linked with cancer registry systems. In Rhode Island, for example, certain oral cancers are treated in the private offices of oral surgeons, some of whom use pathology laboratories in Massachusetts for diagnostic confirmation. Rhode Island and Massachusetts have a reciprocal agreement for sharing certain registry data, but Massachusetts laboratories are not required to report. As a result, Rhode Island cases are lost. A similar problem recently was described in a study of "systematic under reporting of cutaneous malignant melanoma in Massachusetts," estimated to be at least 12%.[7] Solutions to such problems are costly (direct reporting from individual health care providers) or complicated by laws to protect the confidentiality of health care information (direct reporting from laboratories to out-of-state registries). It may be possible, however, to arrange for the voluntary transmission of case reports from out-of-state labs through out-of-state registries having reciprocal data sharing agreements with Rhode Island, a process that will be explored in the future.

> ***Recent upward trends in prostate and breast cancer incidence have been attributed to increases in screening for the two diseases.***

The apparent deficits in prostate and breast cancers are puzzling. Most histologically confirmed cases come to the attention of a hospital tumor registrar or a private pathology lab, all of whom are linked directly with the registry system. Cases that are neither histologically confirmed nor treated (usually diagnosed among patients with other terminal illnesses, many of whom reside in long-term care facilities) may escape registration, but the proportion of these should be low. Published 1975-1979 data from the Connecticut Tumor Registry, for example, reveal that 6% of prostate cancers and 3% of breast cancers known to the registry had not been confirmed histologically (Table 3).[6] Among these, about 1% of both cancers had been identified with death certificate information only, a technique that becomes practical only after a registry system

Fig. 1–Ratio of age-adjusted incidence to age-adjusted mortality, US, whites, by year and gender



Source Gloeckler-Ries LA, Hankey BF, Edwards BK (Eds): Cancer Statistics Review, 1973-1987 NIH Pub. No. 90-2789. Bethesda, Maryland: National Cancer Institute, 1990.

Table 3 – Percentage of newly diagnosed cancers of the prostate and female breast which have been registered on the basis of positive histology, clinical diagnosis, and death certificate only, Connecticut 1975-1979 and Rhode Island 1987-1988

Registration Source	Observed Connecticut 1975-1979 (1)	Observed Rhode Island 1987-1988 (2)	RI 1987-1988, Assuming the CT Value for + Histology Reflects RI Experience[a] (3)
	Cancer of the Prostate		
Positive Histology	93.7	98.4	93.7
Clinical Diagnosis	5.0	1.6	1.5
Death Certificate Only	1.3	0.0	0.0
Total	100.0	100.0	95.2
	Cancer of the Female Breast		
Positive Histology	97.1	99.5	97.1
Clinical Diagnosis	1.9	0.5	0.5
Death Certificate Only	1.0	0.0	0.0
Total	100.0	100.0	97.6

Source: CT–Heston JF, Kelly JAB, Meigs JW, Flannery JT: Forty-five years of cancer incidence in Connecticut: 1935-79. NIH Pub. No. 86-2652. Bethesda, Maryland: National Cancer Institute, 1986. RI–Rhode Island Cancer Registry.

a–The ratio between clinical diagnosis and positive histology found in Rhode Island is also assumed to remain the same: RI positive histology=CT positive histology (93.7); RI clinical diagnosis = (1.6/98.4) * 93.7 = 1.5

Table 4. Estimated completeness of cancer registration in Rhode Island under differing assumptions about the registration of prostate cancer and female breast cancer, white residents, by gender

Gender and Anatomical Site	Expected Incidence in RI (1)	Observed Incidence in RI (2)	Estimated Completeness of Cancer Registration in RI [(2)/(1)] (3)
Assumption 1: Discrepancies between observed and expected incidence of prostate cancer and breast cancer are attributable wholly to incomplete registration.			
MALES	449.0	436.8	0.97
Prostate	89.9	68.8	0.77
Other sites	359.2	368.0	1.02
FEMALES	359.0	341.1	0.95
Breast	116.0	106.0	0.91
Other sites	242.9	235.1	0.97
Assumption 2: Discrepancies between observed and expected incidence of prostate cancer and breast cancer are attributable partly to incomplete registration and partly to differences between the incidence of these diseases in Rhode Island and the United States.			
MALES	431.4	436.8	1.01
Prostate	72.3	68.8	0.95
Other sites	359.2	368.0	1.02
FEMALES	351.6	341.1	0.97
Breast	108.6	106.0	0.98
Other sites	242.9	235.1	0.97

Note: All rates have been age adjusted using the 1970 population ofthe US as the standard population. All rates are expressed as events per 100,000 population.

Source: RI–Rhode Island Cancer Registry. US–Gloeckler-Ries LA, Hankey BF, Edwards BK (Eds.): *Cancer Statistics Review*, 1983-1987. NIH Pub. No. 90-2789. Bethesda, Maryland: National Cancer Institute, 1990 (Expected incidence is based on RI and US statistics.)

has collected information between 5 and 10 years, depending on the expected survival for different cancers, and the availability of resources for follow-up.[8] In Rhode Island, proportionately fewer cases of prostate and breast cancers were reported to the registry in 1987 and 1988 without histological confirmation, suggesting small deficits in the incidence of clinically diagnosed cases (3 per 100,000 for prostate cancers and 3 per 100,000 for breast cancers), but leaving most of the apparent deficits in prostate and breast cancers unexplained.

To explore these deficits further, US cancer ratios for prostate and breast cancers were inspected more closely. Incidence-to-mortality ratios observed between 1973 and 1987, by sex, were plotted in Figures 2 and 3 for prostate and breast cancers, all cancers combined, and cancers other than prostate and breast increased substantially. Rising incidence drove the trends; mortality changed little between 1973 and 1987.

Recent upward trends in prostate and breast cancer incidence have been attributed in part to increases in screening for the two diseases.[2] It is important to note, however, that national incidence rates are estimates derived from a 10% segment of the US population and may differ from actual rates nationwide. The national incidence surveillance system (SEER) was built upon strong existing cancer registries[9] almost always associated with strong cancer treatment programs. For this reason it is quite possible that SEER areas may be ahead of others in state-of-the-art breast and prostate cancer screening, translating into temporarily higher incidence rates and incidence-to-mortality ratios as occult disease is revealed, (when screening use stabilizes, incidence rates should return to baseline trends), higher proportions of early-stage disease, and ultimately, lower morality rates. Following the same scenario, non-SEER areas that improve their screening would eventually experience the same phenomena and come into line with SEER statistics.

Fig. 2 – Ratio of age-adjusted incidence to age-adjusted mortality, US, white males, by year and cancer type.

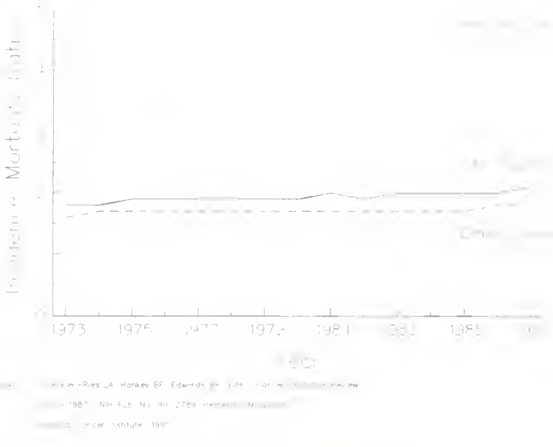
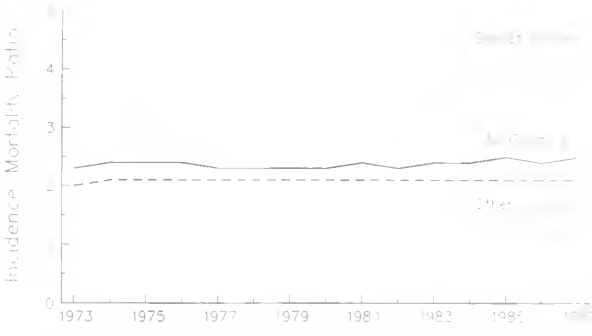


Fig. 3 – Ratio of age-adjusted incidence to age-adjusted mortality, US white females, by year and cancer type.



Source: Gloeckler-Ries LA, Hankey BF, Edwards BK (Eds.) Cancer Statistics Review 1973–1987. NIH Pub No 90-2789 Bethesda Maryland National Cancer Institute, 1990

Recent data suggest that breast cancer incidence may be rising in Rhode Island; the number of newly diagnosed breast cancers increased from 780 in 1987 to 811 in 1988 to 847 in 1989. This increase followed the implementation of a statewide breast cancer screening program in November 1987 and subsequent increases in the proportion of eligible women screened according to current guidelines.[10] Also, small increases have been observed in the portion of early-stage breast cancers diagnosed since 1987, consistent with the greater use of screening mammography. Similar changes have not been noted in the numbers and characteristics of newly diagnosed prostate cancers.

Alternate Estimates of Completeness

Estimates of the overall completeness of cancer registration in Rhode Island were prepared, based on alternate assumptions about the completeness with which prostate and breast cancers have been reported (Table 4). Assuming that national incidence-to-mortality ratios for prostate and breast cancers should obtain in Rhode Island, the completeness of cancer registration for white males is estimated to be 97%, and for white females is estimated to be 95%. Assuming national incidence-to-mortality ratios for prostate and breast cancer should not obtain in Rhode Island, but that Connecticut's experience with death certificate follow-back should, the completeness of cancer registration for white males is estimated to be over 100% and for white females is estimated to be 97%.

Both estimates are based on three fundamental assumptions. First, it is assumed that national incidence-to-mortality ratios for cancers should generally obtain in Rhode Island, or that survival rates are about the same in both areas. This may yield conservatively low estimates of completeness, because SEER areas may actually experience higher survival rates than the rest of the nation, as explained earlier. Regardless, it would be harder to argue the opposite. Second, it is assumed that incidence-to-mortality ratios for cancer are reasonably stable from year to year. This has been demonstrated. To improve the stability of estimates, however, US ratios were based on 5 years' data, while Rhode Island rates were based on 2 years' data. Third, it is assumed that Rhode Island's cancer deaths have not been undercounted. Again, it would be harder to argue the opposite. Rhode Island has a well-earned reputation for the accuracy of its death records, and besides, has one of the highest cancer death rates in the nation.[4] In short, these assumptions seem to be reasonable. One may have a conservative bias. Another was improved by grouping data. There is good reason to believe that the estimates are stable and provide a meaningful basis for additional quality assurance activities.

Assuring Completeness of Cancer Registration in RI

Based on these broad preliminary findings, the registry, in collaboration with the Cancer Information System (CIS) of the Hospital Association of Rhode Island, will design supplementary analyses of reporting procedures that may affect the completeness of cancer registration in the state. Oral surgeons (for oral cancers) and dermatologists (for melanomas of the skin) will be surveyed to explore ways in which the completeness of case reporting may be improved. Selected urologists and breast surgeons will be contacted to explore ways in which prostate and breast cancers may have been lost to the registry. Tumor registrars from throughout the state will be invited to suggest additional analyses.

By "decomposing" Rhode Island's overall incidence-to-mortality ratio by sex, race, and cause, it has been possible to explore Rhode Island's apparent cancer incidence deficit. Hard-to-register cancers such as oral cancers and melanomas of the skin appear to be undercounted. Other apparent deficits have stimulated hypotheses about the comparability of SEER and local rates. Most cancers, however, appear to have "normal" incidence rates, and the state's case-reporting apparatus appears to be sound.

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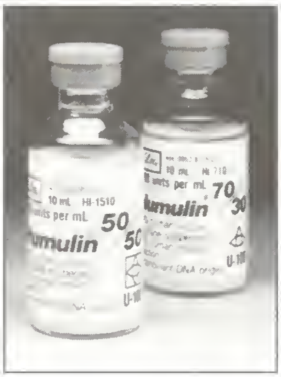

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Screening for Prostate Cancer in Rhode Island During National Prostate Cancer Awareness Week

Steven I. Cohen, MD
Thomas Kingston, MD

Early detection of prostate cancer is believed to be the key to successful treatment, but controversy remains as to what is the most useful, cost-effective screening program.

Adenocarcinoma of the prostate is a major factor in the health of males. The most common cancer among American males,[1] it only ranks fourth among Rhode Island males.[2] It is now equal to colorectal carcinoma as the second most common cause of male cancer death nationwide[1] but again ranks only fourth as a cause of cancer death in Rhode Island.[2]

Early detection of prostate cancer is believed to be the key to successful treatment but controversy remains about what is the most useful, cost-effective screening program. The importance of screening for prostate cancer cannot be overemphasized, particularly in Rhode Island where it appears that the lag in incidence of prostate cancer behind the United States as a whole is due more to a lack of effective screening rather than to a true difference in incidence.

A National Cancer Institute program during National Prostate Cancer Awareness Week (September 17 to 21, 1990) allowed us to coordinate a screening program for prostate cancer in Rhode Island. Herein we summarize these results, draw conclusions about the adequacy of screening efforts for prostate cancer in Rhode Island and review the literature with regard to the current status of prostate cancer screening.

Methods

Before National Prostate Cancer Week, the news media was used to announce prostate cancer screening to men in Rhode Island. Screening was conducted at Roger Williams Hospital and consisted of a digital rectal exam (DRE) performed by one of two urologists. If this exam was felt to be positive or suspicious, a free prostate specific antigen (PSA) test was undertaken. These patients were then notified of their PSA result, and all with suspicious or positive DREs were referred for follow-up to their own urologist, their primary care physician for a urologic referral, or to the Roger Williams Hospital Urology Clinic. Follow-up and further work-up of these patients were left to the discretion of the individual referral urologist. Several months later all patients with suspicious or positive DREs were telephoned to determine the results of follow-up.

Results

During the 5-day screening period 526 men presented for screening by DRE. Of these, 149 (28%) had a positive or suspicious DRE. Following the exam, 33 (22%) of these men had a positive PSA (>4 ng/ml). Therefore, of 526 screened, 33 (6%) had both a positive PSA and positive or suspicious DRE. Forty-four (30%) of the 149 patients with positive or suspicious DREs did not follow-up for further evaluation as instructed. Of the 33 men with both positive or suspicious DREs and positive PSAs 27 (82%) had a biopsy. Of these 27, 6 were positive for carcinoma, representing 1.2% of the 526 men screened.

Discussion

Carcinoma of the prostate is believed to account for about 20% of all newly diagnosed male cancers in the United States and between 10% and 20% of all newly diagnosed cancers in Rhode Island.[1,2] In addition, prostate cancer will account for 11% of all male cancer deaths both nationally and in Rhode Island.[1,2] Regarding prevalence (number of cases in existence at any given time), many believe prostate cancer represents the most common cancer in males. Nationally the incidence of prostate cancer in 1988 was 99 new cases per 100,000 males while the Rhode Island incidence was 66 new cases per 100,000.[2] Why should such a discrepancy exist?

Our screening program detected prostate cancer in at least 1.2% of patients, which is equivalent to the

ABBREVIATIONS USED:

DRE: Digital rectal exam
PAP: Prostate acid phosphatase
PSA: Prostate specific antigen
TRUS: Transrectal ultrasonography

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national detection rate. (The percentage may have been higher considering that 30% of patients with suspicious or positive exams were lost to follow-up.) One can only conclude that the lower annual incidence rate of prostate cancer reported in Rhode Island is due to inadequate or ineffective screening measures. Our study demonstrates that prostate cancer exists in Rhode Island in numbers equivalent to the rest of the United States, but that, statewide, we are not identifying or reporting it effectively.

The incidence and mortality of prostate cancer seem to be increasing; the probability of a white American male eventually developing carcinoma of the prostate rose from 6.1% in 1975 to 8.7% in 1986.[1] Similarly, the probability at birth of a white American male eventually dying from prostate cancer increased from 2% to 2.6% during the same period.[1] Whether these statistical changes merely reflect more accurate and reliable documentation or are actual increases remains unclear. The disparity between the increase in prostate cancer incidence (2.6%) and mortality (0.6%) reflects an apparent increase in survival rate of these patients. This apparent increase may be the result of earlier and better detection as well as earlier and more effective treatment for prostate cancer.

Statistically, however, the mortality rate from prostate cancer has remained essentially unchanged in the past 30 years.[2,3] Lack of progress in terms of changing mortality statistics may be due in large part to the significant percentage of men with advanced disease at the time of diagnosis. About 40% to 60%[3,4] of men have clinically localized disease at the time of diagnosis, and the remainder have either distant metastases (21.5%)[3] or local extracapsular tumor spread (17.7%).[3] Many believe, therefore, that early detection of prostate cancer should reduce mortality from this disease.

The primary screening methods currently available for prostate carcinoma include DRE, PSA and transrectal ultrasonography (TRUS). Kooner, Lee and Stamey[5-7] report that the clinical triad of DRE, PSA and TRUS are the most sensitive and accurate screening measures and will identify 64% of all prostate cancers in men.

Many reports exist regarding screening by DRE alone; Jensen et al and Thompson et al found that survival rates improved markedly when prostate cancer was diagnosed in subsequent years during an ongoing screening program than during the first year of screening.[8-10] They concluded that screening by DRE alone was beneficial.

Other authors, however, including Chodak et al[11] and Mueller et al,[12] dispute this claim by arguing that a high percentage of these patients with clinically localized tumors based on DRE will be classified into higher stages pathologically. Additionally, Stamey[12] reported that patients with tumor volumes less than 3cc have a significantly lower incidence of extracapsular invasion; this implies that even the experienced examining finger may be limited in its ability to detect cancers confined to the prostate.

Carcinoma of the prostate is felt to account for approximately 20% of all newly diagnosed male cancers in the United States and between 10% and 20% of all newly diagnosed cancers in Rhode Island.

Most screening series report the percentage of detected cancers by DRE alone to be 1% to 2%[11,12,14] with positive predictive value for DRE ranging from 6% to 39%.[9,11,12] In our series of 526 men we report a similar detection rate of 1.2%. It must be kept in mind, however, that fully 30% of patients with positive or suspicious DREs were lost to follow-up so this number may actually be higher. Based on all accumulated data to date many authors now agree that screening by DRE alone is limited in its ability to improve early detection of potentially curable tumors.[8]

The use of PSA as a screening tool for prostate carcinoma has gained a significant amount of media attention recently but remains controversial among urologists. While PSA has been clearly established as a more sensitive marker than prostatic acid phosphatase (PAP) for the detection of prostate cancer, approximately 14% to 27% of patients with clinically localized prostate cancer will have a normal PSA.[8,15] Similarly 28% of patients with BPH only will have an elevated PSA.[16]

Many authors have advocated the use of cutoffs for PSA values as guidelines for biopsy, ie, all patients with PSA>10 ng/ml should be biopsied regardless of the findings on DRE.[8] Marcus et al,[17] however, point out that in their series 15 of 15 patients with PSAs greater than 10 ng/ml had evidence of tumor spread beyond the prostate. Thus a higher cutoff may improve the positive predictive value for detection of cancer but may do little to improve survival. PSA does appear to be a useful marker for following patients after radical prostatectomy, radiation therapy or during hormonal therapy and several recent publications support the notion that PSA ultimately may obviate the need for screening or follow-up bone scans.[18,19] To date, however, no studies have shown that widespread screening with PSA has reduced mortality from prostate cancer.

TRUS also remains controversial as a means for screening for prostate cancer. Cooner et al[20] found the detection rate to be 13.6% by TRUS versus 7.6% by DRE; similarly Lee et al[5] found the detection rate by TRUS to be twice that of DRE (2.6% versus 1.3%). Others have noted, however, very low positive and negative predictive values for TRUS (36% and 16% positive predictive values in two studies).[20,21]

The nonspecific nature of abnormal results of TRUS (low positive predictive value) unfortunately, would mean that many men would undergo unnecessary biopsies in order to diagnose a very small number of malignancies. In addition, TRUS adds a significant cost to screening for prostate cancer and a true cost-benefit analysis for screening by TRUS has yet to be done.

Can (and should) we diagnose all these cancers? Should we treat all the patients diagnosed? These questions remain unanswered. Certainly patients with an expected survival of less than 10 years stand to gain little benefit from aggressive screening. For the remainder of the male population, however, the benefit of aggressive screening remains to be determined. Several authors recently noted that while aggressive screening for an individual patient may appear to have great potential benefit, on a larger scale both the expense and potential morbidity could have a substantial negative impact on health care.[8,22] While screening for prostate cancer ultimately may be shown to diminish mortality rates from this malignancy the majority of the early-detection programs designed to determine this are still in progress.

Therefore from our results and after a review of the literature we can conclude the following regarding screening for prostate cancer:

1) The detection rate for prostate cancer in Rhode Island lags behind the national rate by 30%.

2) This low rate of detection is due to lack of adequate screening for prostate cancer or reporting in Rhode Island as supported by our screening results.

3) All physicians in Rhode Island need to be educated regarding the importance of screening for prostate cancer by DRE. Additional efforts have to be made to educate Rhode Island men regarding the need for an annual prostate examination; the importance of follow-up after screening cannot be overemphasized to these patients as a 30% no compliance rate is unacceptably high.

4) DRE in combination with PSA and TRUS can improve the early detection rate of prostate cancer, but it remains unclear whether early detection of prostate cancer will lower mortality from the disease.

5) It remains unclear whether the benefit of more aggressive screening measures, or if there are particular age groups in which more aggressive screening would be warranted.

6) For the present we recommend annual screening by DRE and PSA for all male patients over 45 years; the use of TRUS should be reserved for those patients with suspicious or abnormal prostate exams after referral to a urologist.

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Anne W. Moulton, MD

> *The primary care physician should link weight loss to a current specific medical problem, for example, losing weight in order to reduce blood pressure or elevated cholesterol level.*

The October issue of *Rhode Island Medicine* dealt with the treatment of obesity and included articles by experts in the field of behavioral medicine, surgery and pulmonary medicine. Although all of the articles were informative, questions were left unanswered for the primary care physician treating an obese patient. Most articles acknowledge that obesity is a major public health problem. They suggest that behavior modification is more effective than most treatment methods but add that severely obese people may need medication, surgery or a very-low-calorie diet. The articles conclude by stating that more research is needed in order to develop more powerful treatment strategies for this difficult problem. But what is a primary care doctor to do?

This article will consider that question from a different perspective. It comes from the senior author's work some years ago treating hundreds of obese patients in a variety of behavioral weight reduction programs. Both of us now teach residents in primary care internal medicine and see patients in a primary care practice for women. Obese patients, primarily women, have helped us understand the insensitivities, prejudice and cruelties that they suffer in society and specifically in interactions with physicians. The medical residents we teach, on the other hand, have explained to us their difficulties and frustrations in treating obese patients. These frustrations were validated in a study of primary care physicians in Great Britain, which documented that most general practitioners believe that they have little success in helping their patients lose weight.[1] Based on these two antagonistic points of view, this article will suggest principles that can guide the primary care health provider in the management of obesity. We will focus less on the specifics of dietary planning and exercise management. We will address the process of dealing with the obese patient and the potential problems in the doctor/patient relationship.

Principle 1. Just listen to the patient

The obese patient, like others, has a specific story to tell. If the primary care physician listens to the patient, he or she will hear her* story, often involving a family history of obesity, multiple attempts at weight loss, fellings of isolation, and shame. If a patient is reluctant to bring up her obesity, an open-ended question may be helpful, eg, "Is your weight a problem for you?" Specific inquiry as to how other physicians have dealt with the problem is often helpful. This will allow the patient to talk about which strategies have been beneficial or detrimental in the past. In addition, this gives the patient an opportunity to reveal her attitudes and expectations toward physicians.

Unfortunately, we have heard numerous stories in the recent past of mistreatment of patients. For example, one young woman, recently married, who was approximately 15 pounds overweight, was told, "Well perhaps your weight may not be a problem for you but I wonder how your husband feels?" Another severely obese patient who had developed complications after gastroplasty was told, "You are reporting some unusual side-effects but then you're more intelligent than most of my other patients." An unemployed college graduate who was discouraged about her weight, told her physician she indeed was exercising regularly and her physician replied, "you must be eating like a horse." These prejudicial and hurtful remarks are not uncommon and may indeed explain impairments in the doctor/patient relationship.

Principle 2. Identify a specific medical reason for weight loss.

It is true that obesity is associated with an increased rate of morbidity and mortality. The Framingham Study suggested that even when other factors are controlled, obesity is a major risk factor for the development of cardiovascular disease.[2] However, other researchers, most notably Wooley and Wooley, question whether obesity should be treated at all, challenging whether the temporary weight losses that occur are worth the negative effects

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**We refer to the patient as "she" for simplicity and because the vast majority of people going to treatment for obesity are women.*

of dieting and relapse.[3] In addition, "yo-yo dieting" may have negative effects on cardiovascular functioning.[4] The primary care physician needs to identify why this particular patient needs to lose weight at this point in time. A global attitude of "lose weight because it is good for you," is unlikely to work and may well alienate the patient. The primary care physician should link weight loss to a current specific medical problem, for example, losing weight in order to reduce blood pressure or an elevated cholesterol level. This approach helps the patient understand the direct relationship and physician's cause for concern.

Principle 3. Approach the patient about her obesity with caution and sensitivity.

Obesity may be the last socially acceptable prejudice.[5,6] Fortunately ethnic and racial slurs are now not tolerated in the professional community. Alcoholism and other addictive behaviors have benefitted by being perceived more recently as diseases, rather than lack of will power. Yet obesity still is seen as fair game for jokes and hostile remarks.[7] Once a patient has become obese, she has become stigmatized. This is particularly true for children. There is ample evidence that adolescents suffer enormously from the social anxiety and discrimination associated with obesity.[7,8] By the time the overweight child becomes an overweight adult, (and unfortunately 80% of them do) she is used to being morally judged for being overweight.

There are related biases that compound negative attitudes toward obesity. There is a higher rate of obesity in lower socioeconomic groups. Being overweight is still viewed more positively in some ethnic groups, and the physician may not appreciate the patient's values with respect to weight. Gender bias is another concern. One study found that 40% of all adult women across age and race were actively trying to lose weight, and of those, 85% were dieting in order to do so.[9] In fact, Judith Rodin and her colleagues suggested that being unhappy with weight is now "a normative discontent for women."[10] Forty percent of women in the age group 40 to 49 are obese and 30% of men in this same age category are obese. Yet the vast majority of patients in treatment programs for obesity are women.[9,10] This is a fact that is often ignored in most treatment programs. Hall suggested that the many behavioral strategies for losing weight often neglect one possible alternative: that the woman no longer cook for the entire family.[9] The fact that this possibility is not even suggested in most programs is telling and once again suggests a possibility for gender bias. The pressure on women to lose weight is more intense than it is on men. When a male physician suggests that a woman patient needs to lose weight, he may be heard as being critical rather than as making a health recommendation. It may be helpful for the primary care physician to reflect upon his or her own values, family history and personal concerns about weight since these will impact upon the treatment of obese patients.

> ***. . . this article will suggest principles that can guide the primary care health provider in the management of obesity.***

A final reason for caution is psychological functioning. There is no clear evidence that obese patients, as a rule, are different psychologically than non-obese patients. However, there is some suggestion that morbidly obese patients (those 100% or more than 100 lbs. overweight) may have more complicated psychological problems.[11] Also the *Diagnostic and Statistical Manual-IV* of the American Psychiatric Association will include a new diagnosis of binge-eating. Patients who eat large quantities of food, often at night and feel out of control, may well be a special category who may need psychological attention and may have depression as a concurrent diagnosis. Binge-eaters may need referral to psychotherapy or at the very least, a more extensive psychological assessment prior to being referred to treatment. As with all patients and especially those with anorexia nervosa and bulimia, a history of sexual abuse needs to be explored.

Principle 4. Assess how likely the patient will be able to lose weight at this time.

Most researchers agree that patients who approach physicians for the first time about their obesity may well benefit from a straightforward program of slightly reduced caloric intake and increased exercise. However, these patients are unfortunately rare. More typically, the patient has engaged in numerous if not continuous efforts at losing weight. Brownell suggests that predictors of success at weight reduction include the patients' skills at engaging in self-reinforcement and the patient's ability and willingness to exercise. He adds that patients who are consistently restraining their eating may also respond negatively to another attempt of dieting.[4] Chronic dieting, itself then, may be an indicator of a poor prognosis.

In summary, we need to be selective in the patients we refer for obesity treatment. If we are not careful, we may well be breaking the principle of doing no harm. The competing motivation is, of course, that of helping the patient. Most physicians do want to help their obese patients by assisting them to lose weight, because, they believe with some justification, obesity is associated with many health risks. But as is often the case in medical ethics, these two principles can be in conflict. In this situation, the repeated failures at weight loss and resulting discouragement and alienation may be harmful to the patient.

Let us suppose, however, that the primary care physician has attended to the four principles listed above. What then do we suggest? First of all, do not give the patient a 1,000 calorie-a-day diet and tell her to come back in a month! This is insensitive and counterproductive. The most important consideration in developing a treatment plan for the patient is to take the time to identify beneficial and detrimental aspects of previous attempts at weight loss. In a busy practice the physician may well not have time to do this. In this case the physician should have a specific recommendation of a dietician or weigh reduction program that may be helpful to the patient. Crimmins has suggested that the word "diet" should be eliminated and the patient should be instructed in a gradual change of eating habits and exercise.[12] For those patients who are unaware of nutritional values, a referral to a registered dietician is especially helpful. The registered dietician often takes the time to get the lengthy history from patients who have been on numerous diets as well.

The patients should be cautioned about false labeling of so called "diet foods." A recent study found 15 of 20 products analyzed under-reported caloric content by 4% to 49%.[13] A reasonable adjustment in caloric intake such as a deficit of 500 calories per day can bring about a weight loss of approximately of 1 lb per week.

Even more important is the role of exercise. Most women approaching physicians about their weight are veterans at calorie counting. Increased physical activity, on the other hand, will not only increase the metabolic rate, but can also decrease overall body fat by increasing muscle. Exercise may also enhance feelings of self-efficacy. Walking is the most beneficial exercise for most patients, especially those who are severely obese. It can be done almost any time of the year (with the advent of mall walking), is inexpensive and requires little or no new equipment.

Financial issues also should be considered with the weight loss industry approaching $35 billion per year.[14] Obese people are exploited. If there is a choice between a reasonable self-help group and one that asks the patients to pay thousands of dollars at the beginning of treatment, the physician may well have an ethical obligation to comment.

A final issue is that of social support. Numerous articles have been written on the importance of social support in changing any behavior. Self-help groups in obesity may well be the most effective because of their access to social support. As with many of the addictive behaviors, obese patients may feel most comfortable with other obese people and they can share similar problems and strategies for dealing with the common issues of relapse and discouragement. Family support is also important. Several studies have found that the involvement of spouses in a positive rather than an negative way can facilitate weight loss.[15]

The low-key approach of permanent lifestyle change by increasing exercise and decreasing caloric intake may not be appropriate for the morbidly obese person. A weight loss program that suggests a 1 lb weight loss per week is absurd in many of these situations. Some researchers have suggested surgery in these cases, specifically gastroplasty. However, with surgical mortality rates of up to 4%, informed consent becomes a major issue.[16] Bray suggests the need for the non-amphetamine appetite suppressant medications.[14] Others recommend programs that involve medically supervised, very-low-calorie diets.[12,17]

We believe that these programs should always be followed by a gradual reintroduction of normal food. Patients, of course, should be cautioned as to the risks of over-the-counter fasting and liquid protein diets. We believe that for many morbidly obese patients, the physician is best able to be helpful by showing a nonjudgmental attitude. It is indeed frustrating to deal with problems of relapse. Yet, as Bray points out, we must sort out our clinical concern from our prejudices.[14] It is critically important that physicians not express their frustration and anger at their patients who regain weight.

Stunkard has suggested that the role of the physician in helping patients lose weight turns out to be that of helping them adjust to living in a "semi-starved manner."[18] Although they present a controversial approach, we agree with Smith and Fremouw, in their excellent article on treating obesity, who suggest that one of our major contributions as health care providers may be to help obese individuals with a poor prognosis realistically accept "the development of healthy life styles and self-concept or de-emphasizing weight loss as the primary goal."[19]

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Rhode Island Elderly Injury Review Committee: First-year Progress

Thomas W. Largo, MPH
Ann Thacher-Renshaw, MS
Barbara A. DeBuono, MD, MPH

A study of Rhode Island death certificates indicates that among all age groups in the state, the elderly are at highest risk of fatal injury.

Health issues such as quality of life, health care costs, and health insurance coverage are becoming an integral part of the national agenda. These issues are especially important as they pertain to our elderly population, which is continually increasing.

Rhode Island, in particular, must be concerned with the elderly. According to the 1990 Census, those aged 65 years and over constitute 15% of the state's population, the fourth highest proportion of elderly in the country (behind Florida, Pennsylvania, and Iowa).[1] A primary area of concern is elderly injury. A study of Rhode Island death certificates indicates that among all age groups in the state, the elderly are at highest risk of fatal injury.[2]

Based on these factors, the Injury Prevention Program in the Rhode Island Department of Health (RIDH) has made the prevention of elderly injuries a priority. In early 1991, the Elderly Injury Review Committee, comprised of professionals working with older Rhode Islanders, was formed to examine fatal injuries. Committee members are listed in Table 1. The following summarizes the work of the committee's first year.

Thomas W. Largo, MPH, is epidemiologist, and Ann Thacher-Renshaw, director, for the Injury Prevention Program of the RI Department of Health, Providence, Rhode Island. Barbara A. DeBuono, MD, MPH, is director, RI Department of Health.

Committee Process

The committee met quarterly, beginning in March 1991. The model for the committee was the Child Loss Committee in the Division of Family Health in RIDH, which primarily reviewed mortality information. This committee decided in the first meeting to take an epidemiologic approach to determine the most important causes of injury, high risk groups, and risk factors. The group also decided to include morbidity in its analysis. This inclusion improved the injury profile and increased the ability to test for trends and high risk groups. (Those aged 55 to 64 years were included in one analysis to further increase detection capabilities.)

Prior to evaluating data, members noted that a great deal is already known about elderly injury and that the group should not duplicate previous work. However, it is essential to examine data specific to Rhode Island since they may be distinct in important ways. An accurate injury profile is necessary for the development of properly designed interventions. Finally, the committee defined their responsibilities as extending beyond data analysis to discuss prevention.

Data Sources

The following sources of data were used to develop a profile of elderly injury in Rhode Island:

- Death Certificates (1984 to 1988) provide demographic and cause of injury information on all injury deaths.
- Hospital Discharge Data (1988, 1990) contain information on inpatient demographics and type of injury; cause of injury is not indicated for all injury cases.
- Fatal Accident Reporting System (FARS, 1984 to 1990) provides extensive information pertaining to fatal traffic crashes.
- Rhode Island Hospital Trauma Registry (January to July 1991) provides extensive data on patients admitted to the Trauma Center, generally the state's most seriously injured patients.

Results

Table 2 illustrates the age and sex distribution for Rhode Islanders aged 65 and over, according to the 1990 census. Women constitute 62% of this population. The female-to-male ratio increases with increasing age groups.

The committee's initial task was to determine what causes of injury would be the focus of attention. Based on death certificate data for the years 1979 to 1988,[2] three categories of elderly injury mortality were prominent (Fig 1). In order of the number of deaths

ABBREVIATIONS USED

BAC: Blood alcohol content
FARS: Fatal Accident Reporting System
MV: Motor vehicle
RIDH: Rhode Island Department of Health
SES: Socio-economic status

Table 1 – **Rhode Island Elderly Injury Review Committee**

Stanley M. Aronson, MD	Dean Emeritus of Medicine Brown University School of Medicine
Doris Duarte	Consultant, Long Term Health Care
Richard Evans, MD	Chief Medical Examiner Rhode Island Department of Health
Susan Graefe	Family and Geriatric Therapist Geriatric Consultants
Douglas Kiel, MD	Assistant Professor of Medicine Brown University School of Medicine
Robert LaForge	Assistant Research Professor University of Rhode Island
Marie Strauss	Coordinator of Elderly Services Mental Health Services of Northwestern Rhode Island
Susan Sweet	Associate Director Rhode Island Department of Elderly Affairs

caused, these were 1) falls; 2) motor vehicle(MV) crashes; and 3) suicides.

The committee decided to limit its initial study to these three areas. Because occupants and pedestrians were the primary victims of MV crashes, they were the focus of the MV crash analysis. The following summarizes the major findings for each cause.

Falls

Falls are the leading cause of injury mortality among the elderly in Rhode Island. In addition, falls are by far the leading cause of serious injury requiring hospitalization. The data illustrated in Figure 2 are based on discharges occurring between October 1989 and September 1990 (FY 1990). This discharge profile is consistent with those of previous years. (Note that in FY 1990 external cause of injury codes (E-codes) were provided for only 33% of injury discharges for those aged 65 and over. Those discharges for which an E-code was provided may not be representative of all elderly injuries.)

As illustrated in Figure 3, the risk of a fatal fall increases with age for both sexes. This trend holds for injury hospitalizations. While elderly women sustain more fatal falls annually than men (25 vs 18 during 1984 to 1988), men have higher rates among all age groups due to their smaller population size. The risk of hospitalization, however, is much higher for women. In 1988, the hospitalization rate of women was 680 per 100,000 compared to 320 per 100,.000 for men for E-coded discharges.

Elderly falls are associated with long hospital stays, an average of 11 days for FY 1990 discharges. These long stays may be explained by the severity of the injuries (eg, hip fracture) or by the existence of co-morbid conditions that contribute to the risk of falling.

Fractures are highly prevalent among older Rhode Islanders hospitalized due to a fall. Particularly noteworthy is hip fracture, which is listed as the principal diagnosis in 50% of E-coded discharges. Women sustain 83% of these particular injuries.

Among elderly patients admitted to the Trauma Center, slips or trips on the same level are the primary type of fall. In addition, 66% of the falls leading to Trauma Center admission occur in a private residence, 11% in a residential institution. (E-codes are provided for nearly 100% of trauma cases.)

The risk of a fatal fall increases with lower socio-economic status (SES), as determined by census tract of residence although not significantly. (The SES rates have not been age-adjusted.) Those aged 55 and over who are unmarried have 60% greater risk of a fatal fall than those who are married (statistically significant, p<.05).

Based on the data, the committee made some preliminary hypotheses and recommendations:

1. The higher case fatality ratio for men may be due to greater exposure to high risk situations (eg, fall from a roof). Conversely, women with osteoporosis may sustain serious but non-fatal injuries from falling in lower risk situations (eg, fall on same level).

Fig. 1 – Rhode Island Injury Mortality, Ages 65 and Over, By Cause of Injury, 1979-1988 (N=1162)

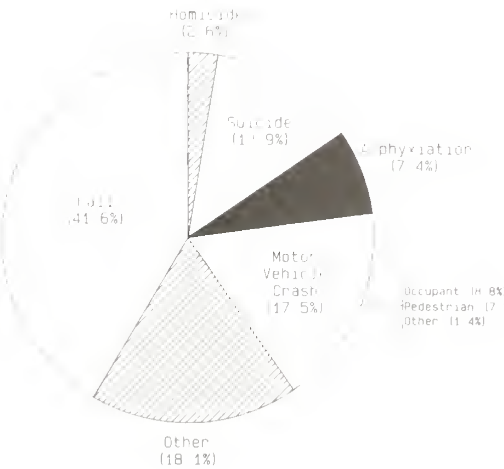


Fig. 2 – Rhode Island Injury Hospitalizations, Ages 65 and Over, by Cause of Injury for E-Coded Discharges, FY 1990 (N=745)

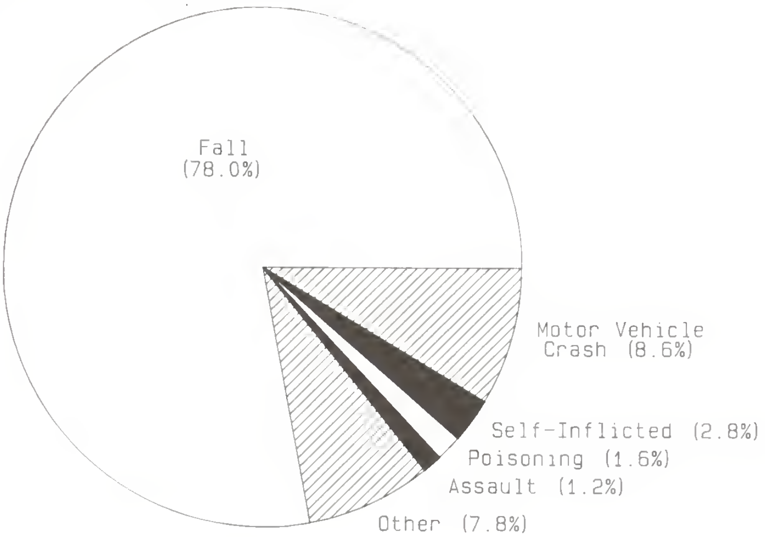


Fig. 3 – Rhode Island Fatalities due to Falls, Ages 65 and Over, by Age and Sex, 1984-1988

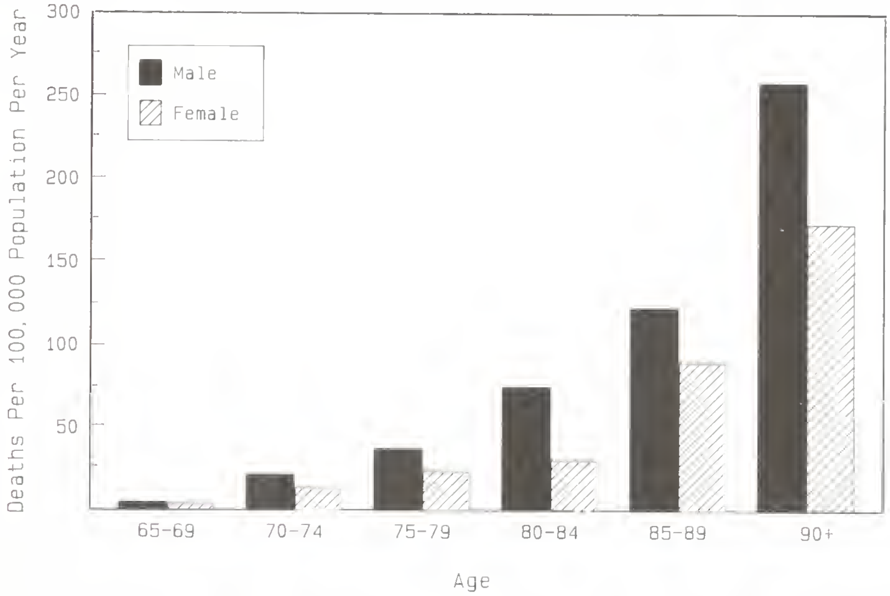


Table 2 – **Demographics of study population (Source: 1990 Census)**

Age	Total	%	Male	%	Female	%
65-69	47,210	31.4	20,821	36.1	26,389	28.4
70-74	38,406	25.5	15,773	27.4	22,633	24.4
75-79	29,669	19.7	10,964	19.0	18,705	20.1
80-84	19,246	12.8	6,036	10.5	13,210	14.2
85+	16,016	10.6	4,050	7.0	11,966	12.9
Total	150,547	100.0	57,644	100.0	92,903	100.0

2. Since many serious fall injuries occur in the home or in institutions and are classified as due to tripping on the same level, programs that assess living conditions and eliminate tripping hazards have potential in reducing the fall injury rate.

3. It was suggested that some of the falls occurring in the home and in institutions may be due to elder abuse, an area that requires further study.

4. The number of elderly fall injuries occurring in residential institutions is greater than expected. Further study is required to determine risk factors of serious falls in these locations.

5. Based on the finding that the unmarried elderly are at elevated risk of a fatal fall, it was hypothesized that the more specific risk factor is living alone.

6. Careful evaluation of fall prevention programs is essential to determine their efficacy and likelihood for success before recommending their widespread implementation.

Motor Vehicle Crash-Occupant

For older people killed in motor vehicles, the mortality rate is 54% higher for men than women. As seen in Figure 4, risk increases with age.

Although no age-adjusting was done, it was found that those who live in higher SES regions are at significantly ($p<.05$) greater risk of fatal injury than those in lower SES areas.

Alcohol is present (Blood Alcohol Content (BAC) $p \geq .01\%$) in 26% of fatally injured elderly drivers. Nationally, alcohol is detected in about 47% of fatally injured drivers of all ages.[3] Ninety percent of those aged 55 years and over, fatally injured in MV crashes during 1984-1990, were unbelted. Overall in Rhode Island during this period, 89% of MV fatalities were unbelted.

The committee suggested that the male-female fatality rate differential could be due to a greater proportion of male drivers resulting in greater exposure in terms of miles driven. In addition, risk may increase with age due to deteriorating driving skills as physical limitations increase.

The trend pertaining to socioeconomic status may be due to those in higher SES brackets having higher vehicle ownership rates. Also, Rhode Islanders residing in rural areas are at higher risk of motor vehicle fatality,[2] and SES level may be related to population density of residence.

To reduce injuries sustained by elderly motor vehicle occupants, the committee suggested:

1. Increasing the frequency and quality of testing the driving capabilities of older drivers, including regular eye exams;

2. Educating older drivers that seat belt use is mandated by law in Rhode Island; this group may be more responsive to this approach than other age groups; and

3. Improving driving alternatives such as mass transit.

Motor Vehicle Crash - Pedestrian

The risk of fatal pedestrian injury appears to increase with age for both sexes (Fig 5) although there were no pedestrian deaths among women aged 85+ for the period of study (1984-1988).

Risk increases significantly ($p<.01$) with decreasing SES (Fig 6), although rates are not age-adjusted. Those living in poverty regions are at particularly high risk.

Of the 37 pedestrian deaths among those aged 55 and over from 1984 to 1990, 16% tested positive for alcohol. Among all age groups during this same period, 28% of fatally injured pedestrians tested positive for alcohol.

More than half (53%) of fatal incidents occur between 4 p.m. and 8 p.m. Driving conditions are generally good: 64% of events occur on dry pavement in either daylight or at night in lighted areas. Two-thirds of the incidents occur on roadways with posted speed limits of 25 mph or less (the actual speeds of the striking vehicles are unknown). The drivers involved in these fatal incidents tend to be young (15 to 24) males (41%).

The intersection of Mineral Spring Avenue and Smith Street in North Providence, Rhode Island was found to be a high risk area, based on the study of elderly pedestrian fatalities. Another high risk area is the Federal Hill/Olneyville section of Providence, Rhode Island.

In the discussion of the above points, committee members noted:

1. Those who live in poverty regions are likely to have greater exposure to motor vehicles as pedestrians since they are more likely to live in areas with greater traffic and less likely to own motor vehicles.

2. An accurate determination of high risk drivers in pedestrian injuries should account for miles driven, which varies with age. This information, however, is difficult to ascertain.

3. The North Providence police department has initiated educational programs to reduce elderly pedestrian injuries in their city.

The committee requires additional data on elderly pedestrian injuries to propose interventions.

Suicide

The suicide rate for older Rhode Islanders (12.6 per 100,000) is relatively low compared to the national rate for those aged 65 and over (21.5). Elderly men in Rhode Island are at more than four times the risk of suicide than women; this elevated risk is true for all age groups (Fig 7). Among men, risk increases with age (due to small numbers for the period 1984-1988, a trend test was not feasible for women's suicide rates).

No association was found between the risk of suicide and SES. The risk of suicide is 50% greater for single elders than their married counterparts (Statistically significant, $p<.05$).

The committee focused primarily on unintentional injuries during the first year. Further analysis of elderly suicide is recommended for the future.

Plans for Year Two

Based on the experience of Year One, the committee has determined

Fig. 4 – Rhode Island Motor Vehicle Occupant Fatalities, Ages 55 and Over, by Age and Sex, 1984-1988

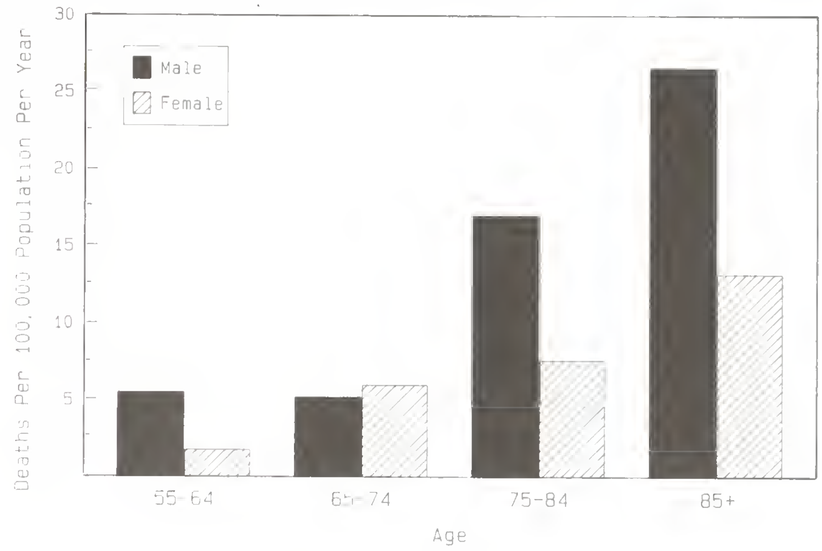
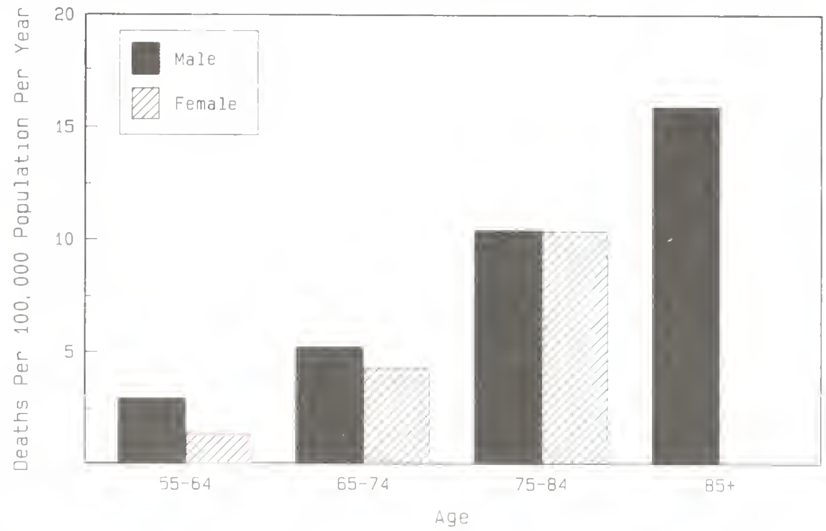


Fig. 5 – Rhode Island Pedestrian Fatalities, Ages 55 and Over, by Age and Sex, 1984-1988



areas for further study as well as additional data needs.

Computerized Medical Examiner data soon will be readily available to the Injury Prevention Program. Information on many more trauma patients also will be available in the upcoming year. These sources will be used to obtain valuable information on seat belt use, toxicology, and circumstances of injury events.

The relationship between marital status and the risk of fall deaths will be further explored. Is being single the risk factor, or is the risk due to living alone? Information on whether decedents were living alone or not may be provided in medical examiner records. In addition, analysis will be done to determine if this finding holds true for non-fatal falls.

Several analyses were done to examine the relationship between the risk of fatal injury and SES, however, these rates were not adjusted for age. Since the different SES groups may have distinct age profiles and the risk of injury was found to increase with age, an accurate statement on the effect of SES must involve age-adjustment.

Non-fatal pedestrian injuries need to be examined to gain more insight in to the elderly pedestrian problem. The Injury Prevention Program is currently developing a report on fatal and non-fatal pedestrian injuries occurring in Providence for all ages. The results of this study will provide valuable infor-

Fig. 6 – Rhode Island Pedestrian Fatalities, Ages 55 and Over, by Socioeconomic Status of Area of Residence, 1984-1988

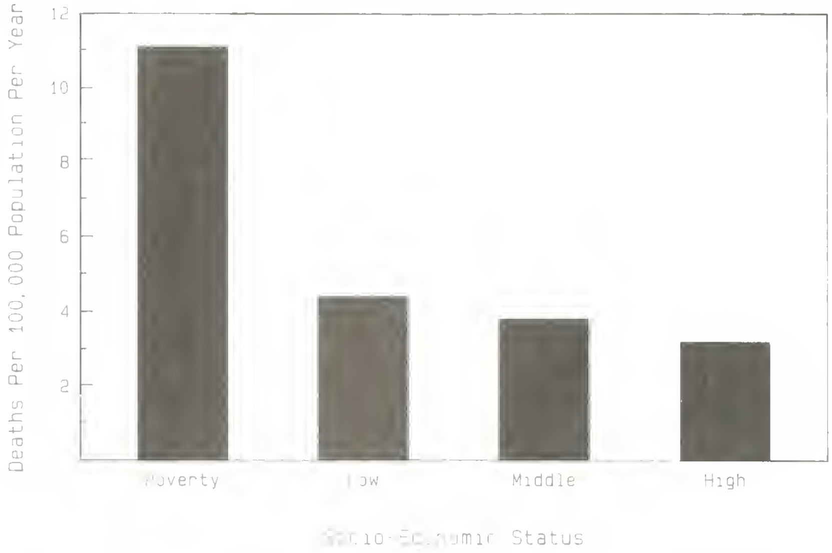
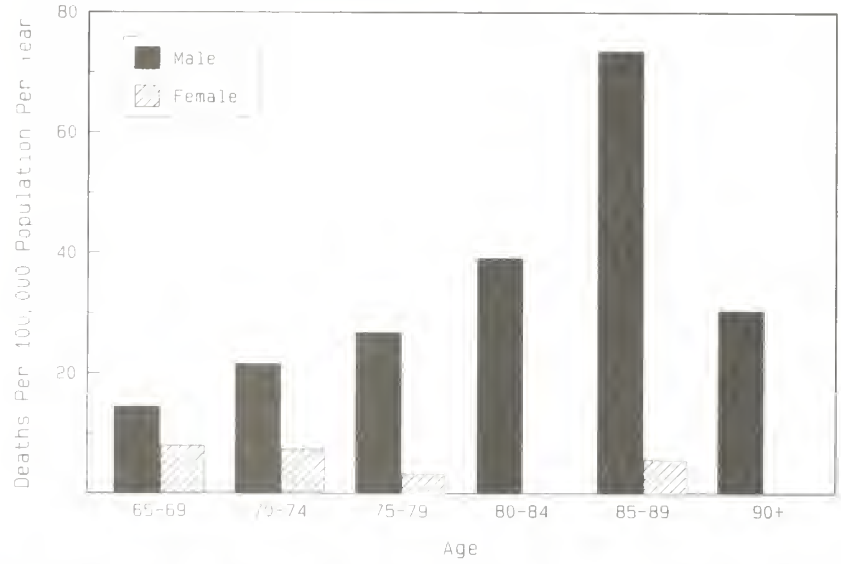


Fig. 7 – Rhode Island Suicides, Ages 65 and Over, by Age and Sex, 1984-1988



mation on elderly pedestrian injuries in that city. The Accident Location Reporting System maintained by the Department of Transportation can be used to locate high risk areas in other areas of the state.

Acknowledgments

We acknowledge the work of Jackie Ascrizzi, program coordinator of the Injury Prevention Program, who provided her program experience to the committee, and Angel L. Reyes and Elizabeth O'Connor who were responsible for data processing and graphics.

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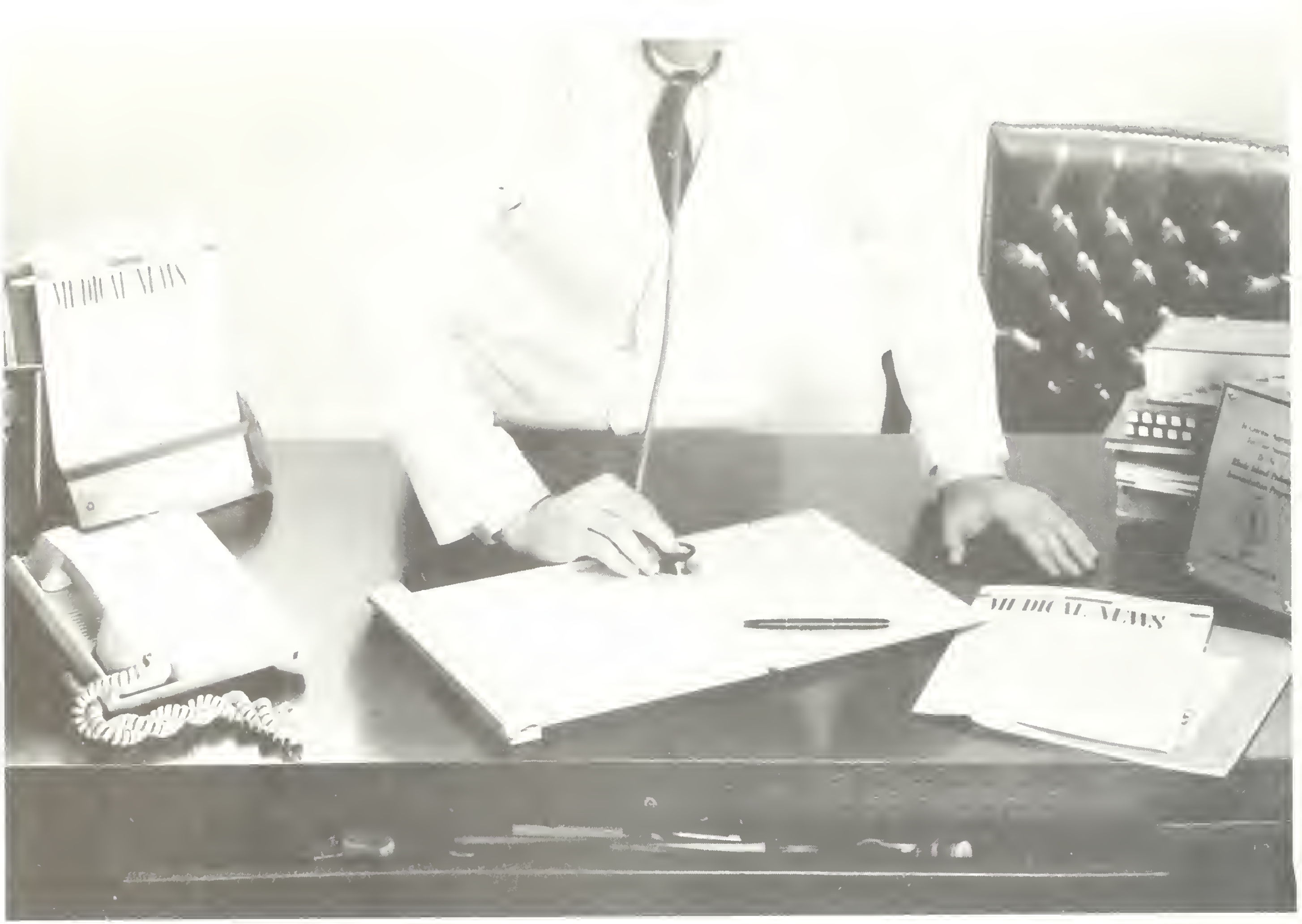

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Lateral Epicondylitis (Tennis Elbow): A Review

Julia A. Katarincic, MD
Arnold-Peter C. Weiss, MD
Edward Akelman, MD

> *Any activity that requires repetitive extension against resistance may initiate the development of pain at the lateral epicondylar region.*

Lateral epicondylitis, more frequently referred to by the lay population as "tennis elbow," presents with the insidious onset of pain over the lateral aspect of the elbow and forearm, most frequently adjacent to the lateral epicondyle. While the condition can be prevalent in tennis players, who have had a reported incidence from 10% to 50%, it is actually more common in the general adult population during the 4th through 6th decades of life when overuse of wrist extension is present.[1] This condition is rarely seen in children, young adults, or the elderly.

Symptomatic patients usually present with a history of chronic repetitive motion activities frequently related to sports or work. Occasionally, they can present with a specific acute event that initiates the symptoms. Any activity that requires repetitive extension against resistance may initiate the development of pain at the lateral epicondylar region. A classic example of this is when patients grab a jug of milk out of the refrigerator and feel pain immediately in the lateral elbow. More infrequently, patients may complain of weakness in the forearm and radiating pain from the elbow along the forearm distally into the dorsal wrist. Patients generally are seen in the nonacute setting since some form of self-treatment is most frequently the rule rather than the exception.

Many hypotheses about the etiology of lateral epicondylitis have been proposed since the condition was first described by Runge in 1873. Most authors have felt that the symptomatology is related to either direct trauma at the origin of the extensor forearm mass with tears, periostitis or an inflammatory bursitis being the most common postulated etiologies.[2] Entrapment neuropathies most frequently related to the posterior interosseous nerve have also been associated with lateral epicondylitis, although these two conditions are more frequently considered distinct clinical entities.[3]

Clinical Examination

Nearly all patients with active lateral epicondylitis have tenderness over the lateral epicondyle of the elbow or over the origin of the extensor carpi radialis brevis (Fig 1). This area of tenderness can sometimes extend distally in the forearm extensor compartment when the inflammatory condition is at peak intensity. Resistance to wrist extension is frequently seen with pain being felt in the lateral epicondyle as this test is applied. Somewhat less frequently, pain at the lateral epicondyle with resisted forearm supination, or pain with simultaneous elbow extension and wrist flexion, are noted in this condition.

Careful examination of the radial tunnel region is essential to differentiate entrapment neuropathy of the posterior interosseous nerve from lateral epicondylitis. Some authors[4] have suggested an intimate relationship between these two conditions making them often clinically inseparable, although the majority of authors do feel that they represent two distinct clinical entities.[5-7] Tenderness in the proximal extensor forearm on deep palpation over the posterior interosseous nerve as it courses beneath the supinator muscle mass should lead to suspicion of radial tunnel syndrome rather than lateral epicondylitis. Pain in the proximal forearm with resisted middle finger extension classically has been associated with radial tunnel syndrome, although there is generally some overlap with lateral epicondylitis with regards to this specific examination.

Rarely is any reduction in elbow or wrist range of motion present with lateral epicondylitis. Grip strength frequently is reduced secondary to pain in the extensor origin or compartment. Numbness or paresthesias in the affected arm also are seen infrequently in conjunction with this condition and most often represent a second independent condition such as carpal tunnel syndrome.

Radiographs of the elbow are usually of little help although, on occasion, a periostitis at the lateral epicondyle is noted, and rare causes of elbow pain, such as tumors, may be

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ABBREVIATIONS USED

ECRB: Extensor carpi radialis brevis
ECRL: Extensor carpi radialis longus
EMG/NCV: Electromyography, nerve conduction velocity

eliminated. Electrodiagnostic studies (EMG/NCV), in rare instances, may provide a diagnosis of radial tunnel syndrome due to abnormal motor potentials; these studies are not a standard in the evaluation of lateral epicondylitis.

Conservative Management

The hallmarks of conservative treatment of lateral epicondylitis are activity modification, splinting, progressive extensor stretching and strengthening, nonsteroidal anti-inflammatory medications, and the injection of corticosteroid medications at the extensor origin.

> ***Careful examination of the radial tunnel region is essential to differentiate entrapment neuropathy of the posterior interosseous nerve from lateral epicondylitis.***

Since the onset of lateral epicondylitis is related most frequently to overactivity or repetitive motion use of the upper extremity, the first order of treatment is alteration of these specific activities. These limitations generally encompass the avoidance of heavy lifting and any wrist extension activities taken against resistance. In patients who participate in athletic activities, modification or elimination of the strenuous aspects of these sports is recommended for a period of time. The various methods of altering the goods used in sporting activities such as increasing the grip size of a tennis racquet, altering the string tension in the racquet head, and decreasing racquet stiffness have been advocated as allowing less stress to be transmitted to the extensors of the forearm.[8] Regardless of this condition's etiology, some form of activity modification for several months is usually the first course warranted in its treatment.

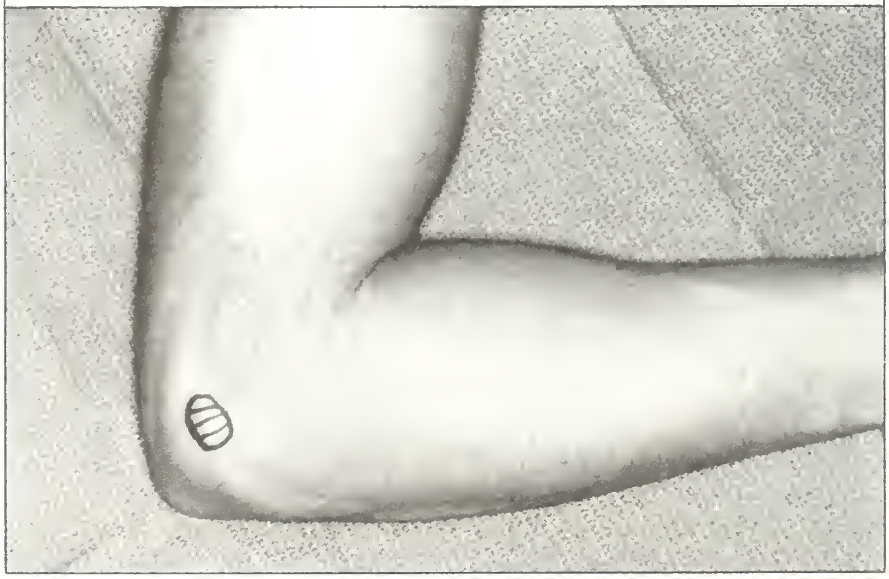
Reduction of the activity that induces inflammation and injury at the extensor origin is the second essential component of treatment. This generally results in the use of a wrist splint to avoid wrist extension activities, thereby allowing the extensor muscle mass a period of inactivity so that healing and inflammatory subsidence may take place at its origin. The use of a proximal forearm band also has been advocated, more for the prevention of progression of this disorder than actual treatment.[8] The use of nonsteroidal anti-inflammatory medication and ice after activity may reduce the overall level of inflammation present at the lateral elbow and provide distinct benefits over what is frequently an extended treatment period.[8] The use of ultrasound[9] with forms of strengthening and stretching with the guidance of a physical or occupational therapist can provide benefit in reducing the symptoms of the disorder. These forms of therapy tend to be more predictable in the later stages of treatment rather than in the early phase.

The use of a corticosteroid injection at the extensor origin seems to provide significant initial symptom reduction in most patients and may provide an excellent and rapid method of reducing the inflammatory response at the lateral elbow. The use of corticosteroid injections must be tempered by the recent observation that collagen healing may be effected adversely by the presence of corticosteroids. For this reason, the number of injections offered to the patient should be held to a reasonable number using an aqueous, soluble corticosteroid so that the reparative healing process is not inhibited.

Surgical Indications

Persistent pain related to the lateral epicondyle or the proximal aspect of the extensor muscle mass represent the most common indication for surgical intervention. Appropriate, conservative management should have been undertaken for a 4 to 6-month period without resolution of symptoms prior to considering operative intervention. Should a patient have no improvement, or in fact, worsen with appropriate conservative management, operative intervention might be appropriately considered prior to 4 months. A careful evaluation and exclusion of adjacent but unrelated conditions of the upper extremity must be undertaken to ensure the appropriate diagnosis of lateral epicondylitis. If a patient demonstrates progressive although not complete, resolution of symptoms with conservative management, surgical intervention should be delayed.

Fig. 1–Point of maximal tenderness frequently seen in lateral epicondylitis. This location is also where a steroid injection is given.



Surgical Considerations

Historically, a number of intra-articular and extra-articular procedures have been described for the treatment of lateral epicondylitis. An understanding of the appropriate anatomy about the lateral epicondyle is essential in understanding what each of these procedures attempts to accomplish. The epitendinous origin of the brachioradialis, extensor digitorum communis, extensor carpi radialis longus and brevis, and the supinator lie along the most distal edge of the lateral epicondyle and just proximal along the humeral ridge. As the radial nerve exits between the two heads of the triceps, the superficial sensory branch runs along the underside of the brachioradialis distally while the posterior interosseous branch courses under the supinator muscle mass. Below the extensor origin lie several ligaments including the orbicular ligament around the radial head and the lateral collateral ligament of the elbow. These structures overlie the elbow joint capsule.

Intra-articular procedures do not directly address the focal pathology noted in lateral epicondylitis and are not frequently performed today.[10-12] Although these procedures do provide the benefit of an examination of the radiocapitellar joint for resulting concomitant lesions and the possibility of a limited synovectomy, they do not directly relate to the extensor muscle origin. Bosworth described success with several procedures involving a release of the orbicular ligament in 17 of 27 patients.[10] It is possible that the successful result in the majority of these patients may have been due to the surgical approach through the extensor fascial mass with its subsequent scarring rather than the procedure or the orbicular ligament itself.

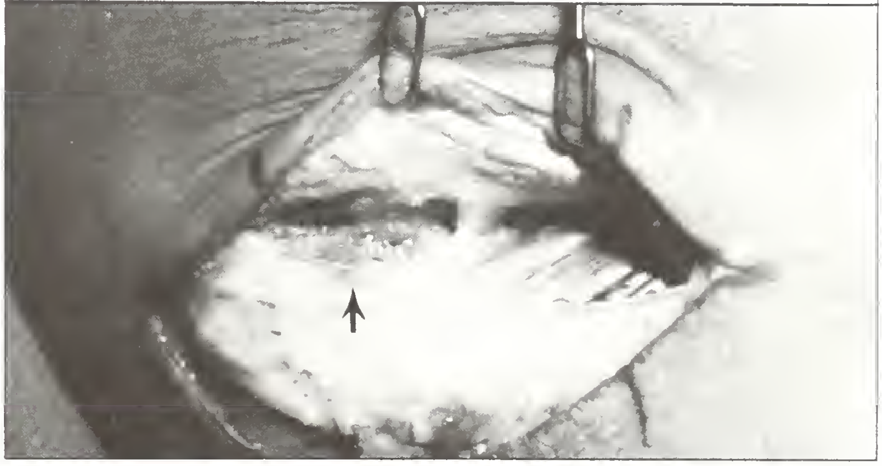
Extra-articular procedures remain the mainstay of surgical treatment for this condition today.[13,14] This type of procedure generally can be classified into two groups. The first involves relieving pressure at the extensor origin by causing a relative lengthening of the extensors themselves.[15,16] This can be accomplished either at the proximal forearm or at any point distally prior to their insertions. Due to the individual branching pattern of the extensor muscles as they course distally, procedures involving the proximal extensor mass tend to be more popular since all the muscle units can be affected. Those which are taken distally have a more limited action.

Persistent pain related to the lateral epicondyle or the proximal aspect of the extensor muscle mass represent the most common indication for surgical intervention.

The second type of procedure frequently undertaken attempts to address the histopathology that has been described at the extensor origin most commonly related to the extensor carpi radialis brevis tendon.[1,13,14,17-19] Frequently a degeneration of the extensor origin is noted with a unique type of granuation tissue being formed which can easily be identified at surgical decompression.[14,19] These types of repair involve excision of all pathologic tissue under the extensor origin with the subsequent repair of healthy tissue to a bleeding bony bed. This type of procedure has the conceptual advantage of actually removing the focal pathology seen in this disorder in attempting a primary repair. One of the theoretical disadvantages of the lengthening procedures is that these may result in a loss of strength with subsequent disability, although these can be significantly easier to accomplish with less generalized morbidity.

In our institution, we historically have performed a procedure incising the extensor origin longitudinally with subsequent excision of any underlying abnormal granulation tissue followed by a repair of the extensor tendon after appropriate lateral epicondylar bony decortication (Fig 2). A slightly curved incision extending from the lateral epicondyle over the extensor muscle mass is undertaken through the subcutaneous tissues. The extensor muscle mass is incised longitudinally with subsequent elevation of the extensor carpi radialis longus fibers anteriorly. A sharp dissection is undertaken to the extensor carpi radialis brevis origin, which is elevated, frequently revealing granuation tissue. It is essential that any nonvascularized tissue be removed prior to repair so that a strong healing response may be effected. A decortication of the lateral epicondyle using an osteotome and a rasp is undertaken so that adequate bleeding tissue is available to aid extensor tendon healing. Several authors have described the alternative tech-

Fig. 2 – Exposure of the interval between the ECRL and ECRB demonstrates a degenerative granulation tissue (black arrow) which should be excised completely prior to repair.



nique of drilling the lateral epicondyle to provide a bleeding tissue. We have favored the actual decortication for its larger surface areas in this procedure. If sufficient extensor tendon remains so that intimate contact is obtained between the extensor origin and the decorticated lateral epicondyle, the extensor tendon is repaired with figure-of-eight Vicryl sutures without direct repair to bone. Should appropriate approximation not be possible due to origin fragmentation, then direct repair through drill holes in the lateral epicondyle is undertaken with an appropriate suture. The wound is then copiously irrigated and the skin closed using either a nylon suture or a subcuticular skin closure. The patient is placed in an immediate long-arm posterior plaster splint which is applied with the elbow at 90 degrees of flexion and the wrist at 45 degrees of extension. This position allows maximal relaxation of the extensor muscle mass so that no tension is imparted upon the healing extensor origin.

Postoperative Protocol

In our opinion, it is essential that appropriate healing of the extensor origin be obtained prior to commencement of active resistive exercises. In addition, significant, preliminary healing should have occurred prior to mobilization of the extensor muscle mass. For these reasons, we advocate the use of a posterior elbow splint at 90 degrees with the inclusion of the wrist at 30 to 45 degrees of extension postoperatively for a total of three weeks. At this point, the patient is changed to wrist immobilization splint alone in slight extension, and elbow range of motion exercises are begun. At 6 weeks postoperatively, all splinting is discontinued with gentle and controlled strengthening being started on the extensor muscle mass. It is important to undertake a very gradual strengthening program since healing of the relatively avascular repair can be prolonged.

We have found no evidence of elbow or wrist stiffness postoperatively with this particular regimen.

Discussion

The treatment of lateral epicondylitis represents an often frustrating experience for the orthopaedic surgeon due to the frequent failure of obtaining a symptomatic improvement in the patient. This relative failure, when compared to other conditions of the upper extremity, is seen in both the conservatively and surgically treated groups. For this reason, the management of patients with lateral epicondylitis in both the early and late stages tends to be more conservative than those of other conditions of the upper extremity. Despite the excision of a well-defined lesion at the lateral epicondyle with an appropriate, strong repair of the extensor origin and protective postoperative therapy regiment, several failures will be encountered by the orthopaedic surgeon with no known cause. The treatment of lateral epicondylitis, therefore, represents a special challenge in that what may seem to be an optimal, technical repair can frequently remain symptomatic. This particular outcome represents the generalized, inexact understanding of this lesion; and with the appearance of operative failures, should stimulate further research into more appropriate methods of both conservative and surgical treatment options.

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December 1992
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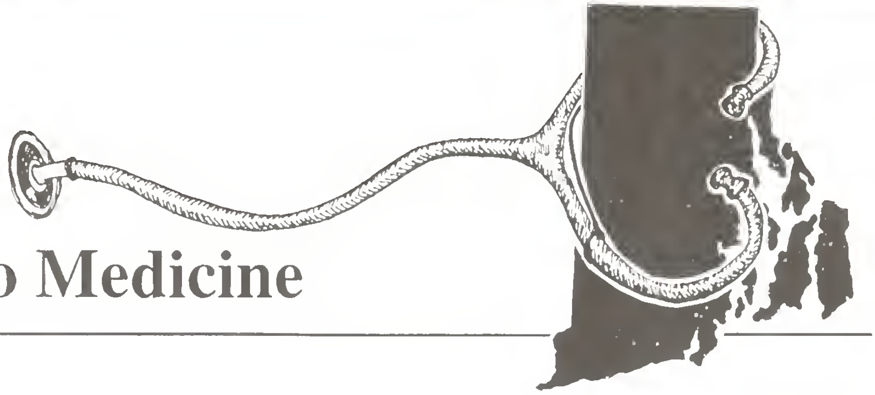

The First Appendectomy in Rhode Island

Seebert J. Goldowsky, MD

Reginald Fitz of Boston read his epochal paper on *Perforating Inflammation of the Vermiform Appendix* before the first meeting of the Association of American Physicians at Washington, DC, in June of 1886. The first successful appendectomy based on a preoperative diagnosis of appendicitis was probably that of Thomas G. Morton of Philadelphia performed on April 27, 1887.[1] The essays of John B. Murphy and Charles McBurney, however, presented in 1889 may be largely credited with acquainting the profession with the desirability of early diagnosis and surgery in this disease.

An excellent paper[2] presented before the Rhode Island Medical Society in 1882 by Dr Robert F. Noyes of Providence is of much local interest. In it he collected from the literature and from his own experience 100 cases of perityphlitic abscess treated by surgical drainage. He reported a mortality of 15% in this group. He was aware of the not infrequent association of appendiceal perforation with the condition, but the implications of this observation eluded him, as it had practically all of his contemporaries.

Seebert Goldowsky, MD had contributed materially to the educational quality of this journal during his many decades as its editor-in-chief. Notable among his many editorial innovations were his frequent articles on medical history, particularly as it pertained to the state of Rhode Island. We are pleased to announce that many of these gems of historic insight, originally published decades ago, will now be reprinted in Rhode Island Medicine *at periodic intervals.*

Surgeons in the Rhode Island area began to make the diagnosis of appendiceal abscess about 1892. A few cases so diagnosed and treated successfully by drainage were reported. The first actual appendectomy in Rhode Island was performed on February 6, 1893, by Dr George L. Collins of Providence. The correct diagnosis was made before operation, and the patient recovered. The following case report is reprinted from the Transactions of the Rhode Island Medical Society for 1893.[3]

A Case of Appendicitis, with
Removal of the Appendix
by
George L. Collins, MD
of Providence

JS, an Englishman, silversmith, twenty-two years of age, married, having been previously seen by Drs Carr and GS Matthews, was admitted to the Rhode Island Hospital, Feb 6th, 1893, with the following history:

February 3d was attacked with a sharp pain in the right iliac region. Since then pain has been continuous with occasional vomiting; the bowels have moved but once.

Temp., 102.6°. Pulse 102. Respiration 25.

Physical examination at time of admission: Abdomen distended, with rigidity of abdominal muscles. Great tenderness in the right iliac region, with dullness and increased resistance. A well marked tumor could be mapped out, its upper border being just below a line drawn from the umbilicus to the anterior superior spine of the ilium. The greatest tenderness on pressure was one inch below the so-called "McBurney's point."

Operation Feb. 6th, 1893, by Dr. Collins, assisted by Dr Keefe. An incision two inches long was made over the centre of the tumor down to the peritoneum.

An aspirating needle was inserted and a small amount of bloody purulent fluid drawn off. The peritoneum was then incised and an entrance effected into cavity about two inches in diameter and three inches deep, which was found to be completely walled off from the general peritoneal cavity. At the base of the cavity the appendix veriformis could be distinctly felt. It was not adherent and appeared to contain some hard masses. The appendix was drawn up to the surface of the wound, ligated with catgut close to its junction with the intestine, and removed. It was much congested and thickened, but not gangrenous.

A rubber drainage tube was inserted, the wound packed with iodoform gauze and dressed with bichloride gauze.

The patient recovered well from the ether, the operation having lasted forty-five minutes.

February 7 (day after operation) – Patient comfortable. Temp., 101º. Pulse 88. Milk diet.

February 8 – Wound dressed. Tube removed. Comfortable. Temp., 99º, 99.5º.

February 10 – Slight discharge of pus. Dressings changed.

February 15 – Dressings changed. Wound clean. No further discharge of pus.

The healing process continued uninterruptedly until March 18th when the patient was discharged cured.

The appendix at the time of its removal was found to contain two masses resembling in size and appearance grains of corn. On section and examination these bodies were found to be composed of hardened faeces.

I have reported the above case with the object of bringing forward two points of interest.

First – The ease with which the appendix was found and brought to the surface – it not being bound down or obscured by adhesions – and, although being inflamed and thickened, it lay free in the abscess cavity.

Second – *I have thought it of interest to put this case on record, as it is the first instance of the operation for the removal of the vermiformis appendix which has been performed in this state.* (Italics ours.)

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Action: Yohimbine blocks presynaptic alpha-2 adrenergic receptors Its action on peripheral blood vessels resembles that of reserpine, though it is weaker and of short duration. Yohimbine's peripheral autonomic nervous system effect Is to increase parasympathetic (cholinergic) and decrease sympathetic (adrenergic) activity. It is to be noted that in male sexual performance, erection is linked to cholinergic activity and to alpha-2 adrenergic blockade which may theoretically result in increased penile inflow, decreased penile outflow or both.

Yohimbine exerts a stimulating action on the mood and may increase anxiety. Such actions have not been adequately studied or related to dosage although they appear to require high doses of the drug. Yohimbine has a mild anti-diuretic action, probably via stimulation of hypothalmic centers and release of posterior pituitary hormone.

Reportedly, Yohimbine exerts no significant influence on cardiac stimulation and other effects mediated by B-adrenergic receptors, its effect on blood pressure, if any, would be to lower it, however no adequate studies are at hand to quantitate this effect in terms of Yohimbine dosage.

Indications: Yocon® is indicated as a sympathicolytic and mydriatric. It may have activity as an aphrodisiac.

Contraindications: Renal diseases, and patient's sensitive to the drug. In view of the limited and inadequate information at hand, no precise tabulation can be offered of additional contraindications.

Warning: Generally, this drug is not proposed for use in females and certainly must not be used during pregnancy. Neither is this drug proposed for use in pediatric, geriatric or cardio-renal patients with gastric or duodenal ulcer history. Nor should it be used in conjunction with mood-modifying drugs such as antidepressants, or in psychiatric patients in general.

Adverse Reactions: Yohimbine readily penetrates the (CNS) and produces a complex pattern of responses in lower doses than required to produce peripheral a-adrenergic blockade. These include, anti-diuresis, a general picture of central excitation including elevation of blood pressure and heart rate, increased motor activity, irritability and tremor. Sweating, nausea and vomiting are common after parenteral administration of the drug.[1,2] Also dizziness, headache, skin flushing reported when used orally.[1,3]

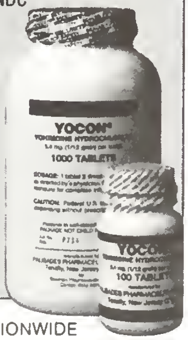
Dosage and Administration: Experimental dosage reported in treatment of erectile impotence.[1,3,4] 1 tablet (5.4 mg) 3 times a day, to adult males taken orally. Occasional side effects reported with this dosage are nausea, dizziness or nervousness. In the event of side effects dosage to be reduced to ½ tablet 3 times a day, followed by gradual increases to 1 tablet 3 times a day. Reported therapy not more than 10 weeks.[3]

How Supplied: Oral tablets of Yocon® 1/12 gr. 5.4 mg in bottles of 100's NDC 53159-001-01 and 1000's NDC 53159-001-10.

References:

1. A. Morales et al., New England Journal of Medicine: 1221. November 12, 1981.
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p. 176-188. McMillan December Rev. 1/85.
3. Weekly Urological Clinical letter, 27:2, July 4, 1983.
4. A. Morales et al., The Journal of Urology 128: 45-47, 1982.

Rev. 1/85



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HEALTH BY NUMBERS

Rhode Island
Department of Health
Barbara A. DeBuono, MD, MPH
Director of Health

Fruits and Vegetables in the Rhode Island Diet

The more fruits and vegetables an individual consumes the less likely he or she will develop cancer of the colon, breast, lung, oral cavity, larynx, esophagus, stomach, bladder, uterine cervix, or pancreas.[1] Eating fruits and vegetables also may contribute to cardiovascular health by replacing fattier foods in the diet.[1] Accordingly, increased consumption of fruits and vegetables has been selected as one of the nation's year 2000 health objectives:

> Objective 2.6: "Increase complex carbohydrate and fiber-containing foods in the diets of adults to 5 or more servings for vegetables (including legumes) and fruits [emphasis added], and to 6 or more daily servings for grain products."[1]

In 1991, only about one-fourth of adult Americans were consuming five or more servings of fruits and vegetables daily. Median consumption was 3.4 servings, with slightly lower consumption among Hispanics, young adults, those with less schooling, and those with lower incomes.[2]

Between January and November 1989, the RI Department of Health surveyed a random sample of 787 Rhode Island residents, ages 18 and over, measuring their consumption of a variety of foods. Respondents were contacted by telephone, using random digit dialing to include unlisted numbers in the universe of potential respondents. Because the sample reflects the ethnic and racial structure of the Rhode Island population, too few minority individuals were interviewed among 787 respondents to analyze the data by race or ethnicity. Respondents were asked to estimate how many times each day, week, or month they ate 44 different types of food, including fruits and vegetables. Portion sizes were not estimated. The survey results presented herein have been weighted to account for the number of telephones and adults (and their genders and ages) in each household surveyed, using the methodology of the Behavioral Risk Factor Surveillance System designed by the Centers for Disease Control.

Similar to other Americans, the average Rhode Island adult ate fruits and vegetables less than five times daily in 1989. Overall, about 29% of adult Rhode Islanders met this objective, with a median of 4.1 servings per day (about the same as all adult Americans, given sampling variance). A smaller percentage of younger adults than older adults met the objective (Fig 1), and a smaller percentage of less well educated than better educated adults met the objective (Fig 2). The effects of age and education are independent of one another and may interact (Table 1); only 14% of younger adults without a high school diploma met the objective, while 45% of older adults with more education than a high school diploma met the objective. Neither gender nor income was found to be related to fruit and vegetable consumption.

Based on a large scale study in California, the National Cancer Institute and the Produce for Better Health Foundation are fielding a national intervention to promote increased consumption of fruits and vegetables in the American diet, "5 a Day for Better Health." The intervention has three components: a media campaign, a program for participating supermarkets, and a community-based program. The RI Department of Health is collaborating with the University of Rhode Island and Brown University to enhance the effect of "5 a day" in the state and will continue monitoring progress toward the national objective.

References

[1] *Healthy People 2000*. Washington, DC: US Department of Health and Human Services, Public Health Service; 1991. DHHS Publication No. (PHS) 91-50212.

[2] Subar AS, Heimendinger J, Krebs-Smith SM, et al. *5 a Day for Better Health: a Baseline Study of Americans' Fruit and Vegetable Consumption*. Rockville, MD: National Cancer Institute; 1992.

Submitted by Francis A. Donahue and John P. Fulton, Office of Chronic Disease Prevention and Health Promotion. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD.*

Fig. 1 – Percentage of Rhode Island residents who eat fruits and vegetables five or more times per day, by age

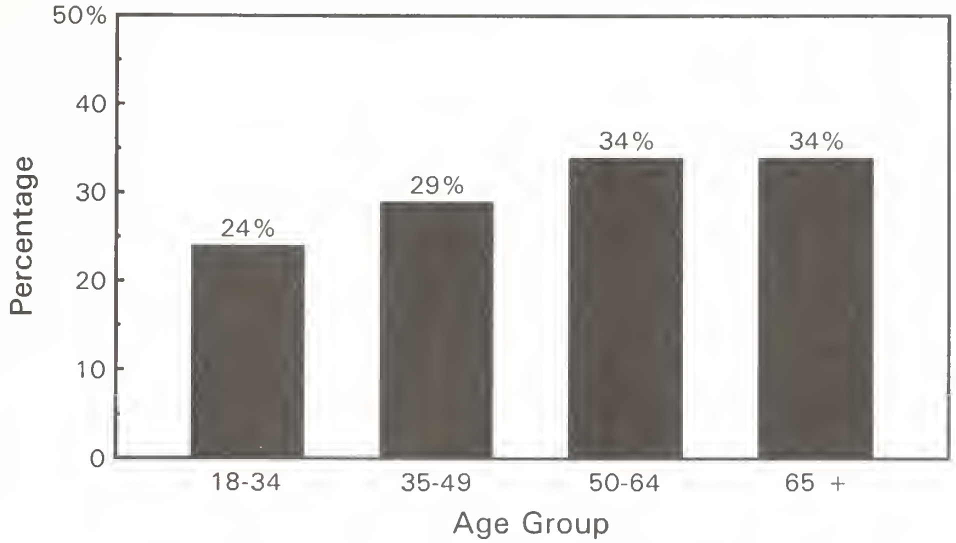


Fig. 2 – Percentage of Rhode Island residents who eat fruits and vegetables five or more times per day, by education

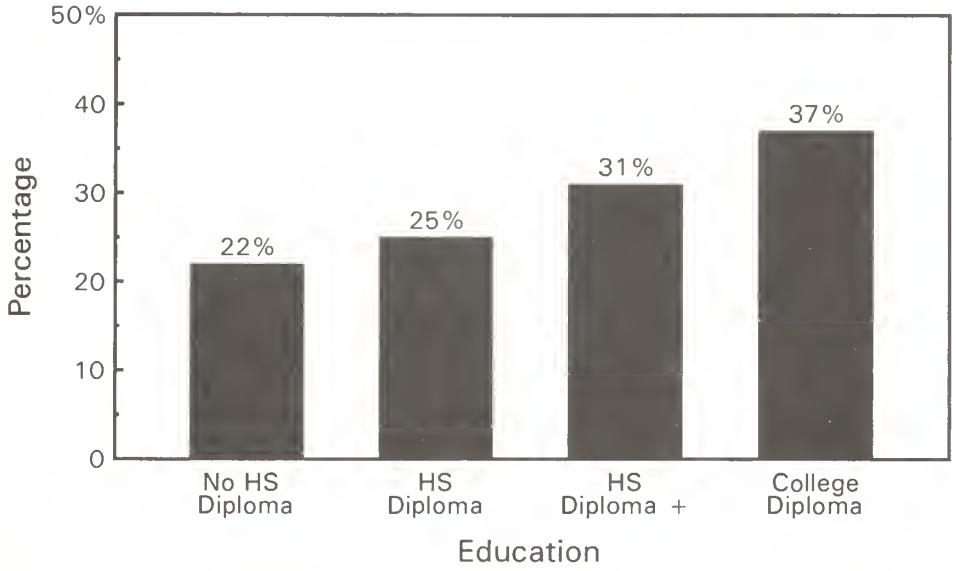
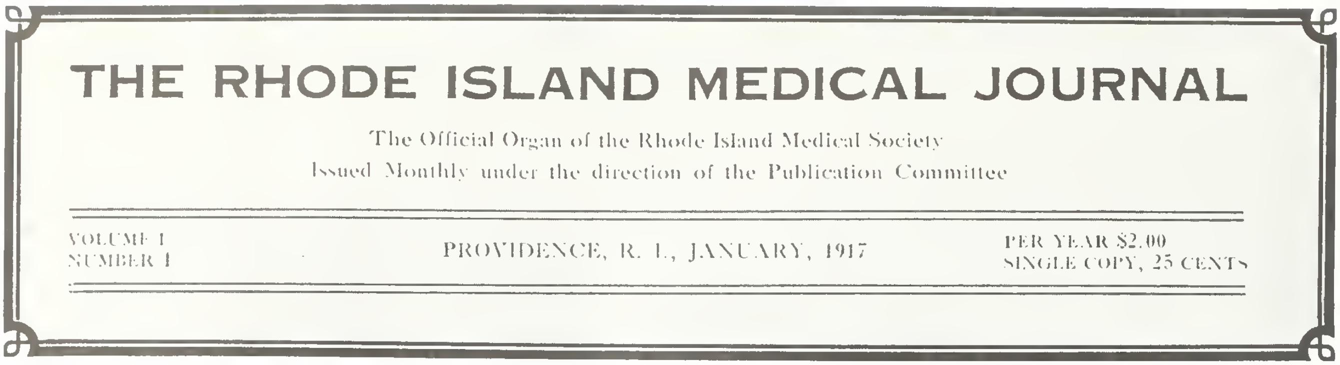


Table 1.–Percentage of Rhode Island residents who eat fruits and vegetables five or more times per day, by age and education

Education	Age Group		
	18-49	50+	All
No HS Diploma	14%	26%	22%
HS Diploma	22%	31%	25%
HS Diploma + or College Degree	30%	45%	34%
All	26%	34%	29%

Source: Rhode Island Department of Health, 1989



THE RHODE ISLAND MEDICAL JOURNAL

The Official Organ of the Rhode Island Medical Society
Issued Monthly under the direction of the Publication Committee

VOLUME I
NUMBER 1

PROVIDENCE, R. I., JANUARY, 1917

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

Ninety Years Ago
(November, 1902)

The lead editorial asks the compelling question: Are there, in Rhode Island, too many medical clubs? The commentary first notes that the usefulness of a medical society cannot be measured solely by what it does for the individual member but rather what it does, collectively, for the medical profession. Accordingly then, it becomes imperative that the membership be both broad and representational; that the labor not be relegated to but a few; that the rank and file not come late to meetings and ". . . impatiently wait for the adjoinment and hasten to the refreshments furnished." The editorial acknowledges the merit of small subspecialty groups but notes that they detract from the value of the larger, general society. It concludes: "The value of this Association can be materially enhanced by widening our sphere of action, enrolling new members, increasing our stock of live ones and burying the dead. If it is argued that such a society would be cumbersome then let it be divided into sections as are the Academies of Medicine in other cities where members engaged in surgery, in gynecology, in pediatrics, may meet and discuss topics in which they are particularly qualified and where once a month a general meeting may be held as at present but with larger attendance and greater interest."

The second editorial addresses a scientific issue of great controversy, autointoxication from adenoids, calling attention to the constitutional manifestations secondary to infectious processes of the adenoid structures in children. When sufficiently large in amount, these adenoidal tissues will interfere with nasal breath, and in the judgment of most, should then be resected. It is the intoxications emanating from moderate amounts of adenoidal tissue that prompts this editorial. The argument is stated as follows: Adenoid tissue furnishes a suitable nidus for the lodgment of infectious material and that the aggravated symptoms (ie, autointoxications) are due to such infection. The editorial ends with the following: "We can all testify that this tendency to catch cold is lessened by the removal of the vault of even a moderate amount of hypertrophied lymphoid tissue and the liability to infectious diseases is certainly less."

Another editorial discusses the popular image of the professional physicians as perceived by the general public in the year 1902. The following summary of this image is offered: "The professional man is above all things learned. In spite of the public's demand that the professional man be serious, he should not be only serious. There are certain staid amusements that the public will without question allow the doctor, such as collecting or gardening; but . . . the doctor's amusements must not be too frivolous. It is well for the professional man at intervals to drop his work, come down to unintellectual amusement, and like Antaeus of old, rise from his lapse from dignity with renewed strength.

Fifty Years Ago
(November, 1942)

The lead contribution is a paper on new phases of cancer research by Herman C. Pitts, MD, president of the American Society for the Control of Cancer. The author decries a governmental attitude that provides a social security system, advocating instead that individuals remain independent and create their own security – particularly so since the life expectancy has now reached the elderly level of 63.5 years. "Science by increasing our life span is responsible in large measure for increasing paternalism and that it is also to science that we must look for at least a partial solution." He notes further, "There are roughly 474,000 cases of cancer in the country at all times. This is a large figure whose elimination as a possible source of disability and consequent public care would aid considerably in reducing the number of those who receive." After citing recent advances in such modalities as radiation, Pitts cites the early investigative work pointing to a possible anticancer cytostatic role of certain chemicals – analogous perhaps to the bacteriostatic effects of certain sulfa drugs. Perhaps, the author speculates, these envisioned anticancer drugs might have an ever greater effect when they are conjoined with radiation therapy.

John E. Farrell writes on an experiment in sickness insurance, citing a new piece of Rhode Island legislation using funds derived from the federal government through the social security program.

A brief article describes the inpatient volunteer department and its functioning at the Rhode Island Hospital. The volunteer service is a branch of Social Service and consists of two volunteer branches: the Gray Ladies, and the Nurses Aides trained by the American Red Cross. These unsalaried personnel vary in age from 16 to 72 years. With the nation at war, these volunteers are of greater value and offer to the hospital a new channel of communication to the community.

Much of this issue is assigned to the compelling need for further physicians to be recruited for the armed services and the problems resulting from parallel shortages of physician services for the civilian community of Rhode Island.

Twenty-Five Years Ago (November, 1967)

A brief note on Rhode Island Medicaid requirements, defines the annual income levels set for the medically needy. For a single individual, the threshold is $2,500; for a family of four, $4,300.

The first major article is written by Robert H. Browning, MD, Professor of Medicine at Ohio State University, discussing the physician and cigarette smoking. The author cites the following statistic to emphasize the unnecessary toll of cigarette smoking in the United States: 300,000 premature deaths; life expectancy reduced by about 4 years for each smoker; 77 million extra days of disability per year, representing 19% of the national total, attributed directly to smoking. In 1966, 74 million packs of cigarettes were sold each day, consumed by 59 million regular smokers, paying retail about $8.2 billion annually. The author concludes; "The pervasive habit of cigarette smoking is stimulated by massive advertising and social pressures, and maintained by psychological and physiological habituation. An overwhelming majority of physicians accept the association between cigarette smoking and coronary heart disease, bronchogenic carcinoma, bronchitis-emphysema, and others. It has become evident that these diseases represent the greatest man-made epidemic in human history."

Spiros Tamvakopoulos, MD, writes on bone-seeking isotopes in the study of calcium metabolism and bone physiology. He observes: "Osteophilic isotopes have opened new vistas in the study of calcium and bone metabolism. The interpretation of data obtained is extremely complicated and has provided no definitive answers to the problems of bone mineral metabolism."

A brief biography of Dr Ephraim Bueno, the 17th century physician and scholar who was the subject of two portraits painted by Rembrandt, is offered by Harry A. Savitz, MD.

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John Farrell summarizes the report on public relations and publicity assembled by the Committee on Public Policy and Relations of the Rhode Island Medical Society.

The *Journal* provides its readership with the medical directives for occupational health nurses proposed by the Committee on Industrial Health of The Rhode Island Medical Society.

An editorial describes the curious meteorologic events recorded in May 19, 1870 when deep clouds of a yellowish hue descended over Providence and much of southeastern New England. By noon it was so dark that candle light was needed within the homes. No immediate explanation for this curious happening was then available. James Manning, president of Brown University, "found divine portents in the phenomenon." Some clergy thought that the day of judgment was come. A short time later, Samuel Williams, a professor at Harvard, ascribed the phenomenon to large and extensive forest fires in Maine, New Hampshire and Vermont. Analysis of the fallout from the clouds showed it to be of common black ash ("without any sulphurous or other mixture to reassure those who were expecting the fire and brimstone of Judgment Day.")

INFORMATION FOR AUTHORS

Manuscripts: Manuscripts will be accepted for consideration with the understanding that they are original contributions, have never been published or submitted elsewhere, and are submitted only to the *Rhode Island Medicine*.

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Abbreviations: *Rhode Island Medicine* attempts to avoid the use of jargon and abbreviations. All abbreviations, especially of laboratory and diagnostic procedures, must be identified in the text.

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Special arrangements must be made with the editors for excessive numbers of illustrations. Color plates are not acceptable.

Identification of Patients: Names, initials should not be used. Use of numbers is a preferable form of identification.

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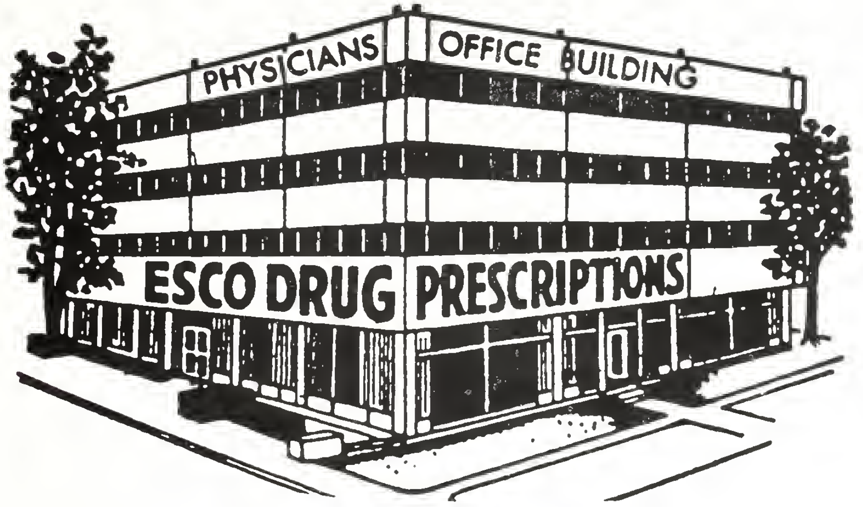

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‡ Verapamil should be administered cautiously to patients with impaired renal function.

BRIEF SUMMARY

Contraindications: Severe LV dysfunction (see *Warnings*), hypotension (systolic pressure < 90 mm Hg) or cardiogenic shock, sick sinus syndrome (if no pacemaker is present), 2nd- or 3rd-degree AV block (if no pacemaker is present), atrial flutter/fibrillation with an accessory bypass tract (eg, WPW or LGL syndromes), hypersensitivity to verapamil.

Warnings: Verapamil should be avoided in patients with severe LV dysfunction (eg, ejection fraction < 30%) or moderate to severe symptoms of cardiac failure and in patients with any degree of ventricular dysfunction if they are receiving a beta-blocker. Control milder heart failure with optimum digitalization and/or diuretics before Calan SR is used. Verapamil may occasionally produce hypotension. Elevations of liver enzymes have been reported. Several cases have been demonstrated to be produced by verapamil. Periodic monitoring of liver function in patients on verapamil is prudent. Some patients with paroxysmal and/or chronic atrial flutter/fibrillation and an accessory AV pathway (eg, WPW or LGL syndromes) have developed an increased antegrade conduction across the accessory pathway bypassing the AV node, producing a very rapid ventricular response or ventricular fibrillation after receiving I.V. verapamil (or digitalis). Because of this risk, oral verapamil is contraindicated in such patients. AV block may occur (2nd- and 3rd-degree, 0.8%). Development of marked 1st-degree block or progression to 2nd- or 3rd-degree block requires reduction in dosage or, rarely, discontinuation and institution of appropriate therapy. Sinus bradycardia, 2nd-degree AV block, sinus arrest, pulmonary edema and/or severe hypotension were seen in some critically ill patients with hypertrophic cardiomyopathy who were treated with verapamil.

Precautions: Verapamil should be given cautiously to patients with impaired hepatic function (in severe dysfunction use about 30% of the normal dose) or impaired renal function, and patients should be monitored for abnormal prolongation of the PR interval or other signs of overdosage. Verapamil may decrease neuromuscular transmission in patients with Duchenne's muscular dystrophy and may prolong recovery from the neuromuscular blocking agent vecuronium. It may be necessary to decrease verapamil dosage in patients with attenuated neuromuscular transmission. Combined therapy with beta-adrenergic blockers and verapamil may result in additive negative effects on heart rate, atrioventricular conduction and/or cardiac contractility; there have been reports of excessive bradycardia and AV block, including complete heart block. The risks of such combined therapy may outweigh the benefits. The combination should be used only with caution and close monitoring. Decreased metoprolol and propranolol clearance may occur when either drug is administered concomitantly with verapamil. A variable effect has been seen with combined use of atenolol. Chronic verapamil treatment can increase serum digoxin levels by 50% to 75% during the first week of therapy, which can result in digitalis toxicity. In patients with hepatic cirrhosis, verapamil may reduce total body clearance and extrarenal clearance of digitoxin. The digoxin dose should be reduced when verapamil is given, and the patient carefully monitored. Verapamil will usually have an additive effect in patients receiving blood-pressure-lowering agents. Disopyramide should not be given within 48 hours before or 24 hours after verapamil administration. Concomitant use of flecainide and verapamil may have additive effects on myocardial contractility, AV conduction, and repolarization. Combined verapamil and quinidine therapy in patients with hypertrophic cardiomyopathy should be avoided, since significant hypotension may result. Concomitant use of lithium and verapamil may result in an increased sensitivity to lithium (neurotoxicity), with either no change or an increase in serum lithium levels; however, it may also result in a lowering of serum lithium levels. Patients receiving both drugs must be monitored carefully. Verapamil may increase carbamazepine concentrations during combined use. Rifampin may reduce verapamil bioavailability. Phenobarbital may increase verapamil clearance. Verapamil may increase serum levels of cyclosporin. Verapamil may inhibit the clearance and increase the plasma levels of theophylline. Concomitant use of inhalation anesthetics and calcium antagonists needs careful titration to avoid excessive cardiovascular depression. Verapamil may potentiate the activity of neuromuscular blocking agents (curare-like and depolarizing); dosage reduction may be required. There was no evidence of a carcinogenic potential of verapamil administered to rats for 2 years. A study in rats did not suggest a tumorigenic potential, and verapamil was not mutagenic in the Ames test. Pregnancy Category C. There are no adequate and well-controlled studies in pregnant women. This drug should be used during pregnancy, labor, and delivery only if clearly needed. Verapamil is excreted in breast milk; therefore, nursing should be discontinued during verapamil use.

Adverse Reactions: Constipation (7.3%), dizziness (3.3%), nausea (2.7%), hypotension (2.5%), headache (2.2%), edema (1.9%), CHF, pulmonary edema (1.8%), fatigue (1.7%), dyspnea (1.4%), bradycardia: HR < 50/min (1.4%), AV block: total 1°,2°,3° (1.2%), 2° and 3° (0.8%), rash (1.2%), flushing (0.6%), elevated liver enzymes, reversible non-obstructive paralytic ileus. The following reactions, reported in 1.0% or less of patients, occurred under conditions where a causal relationship is uncertain: angina pectoris, atrioventricular dissociation, chest pain, claudication, myocardial infarction, palpitations, purpura (vasculitis), syncope, diarrhea, dry mouth, gastrointestinal distress, gingival hyperplasia, ecchymosis or bruising, cerebrovascular accident, confusion, equilibrium disorders, insomnia, muscle cramps, paresthesia, psychotic symptoms, shakiness, somnolence, arthralgia and rash, exanthema, hair loss, hyperkeratosis, macules, sweating, urticaria, Stevens-Johnson syndrome, erythema multiforme, blurred vision, gynecomastia, galactorrhea/hyperprolactinemia, increased urination, spotty menstruation, impotence.

2/13/92 • P92CA7196V

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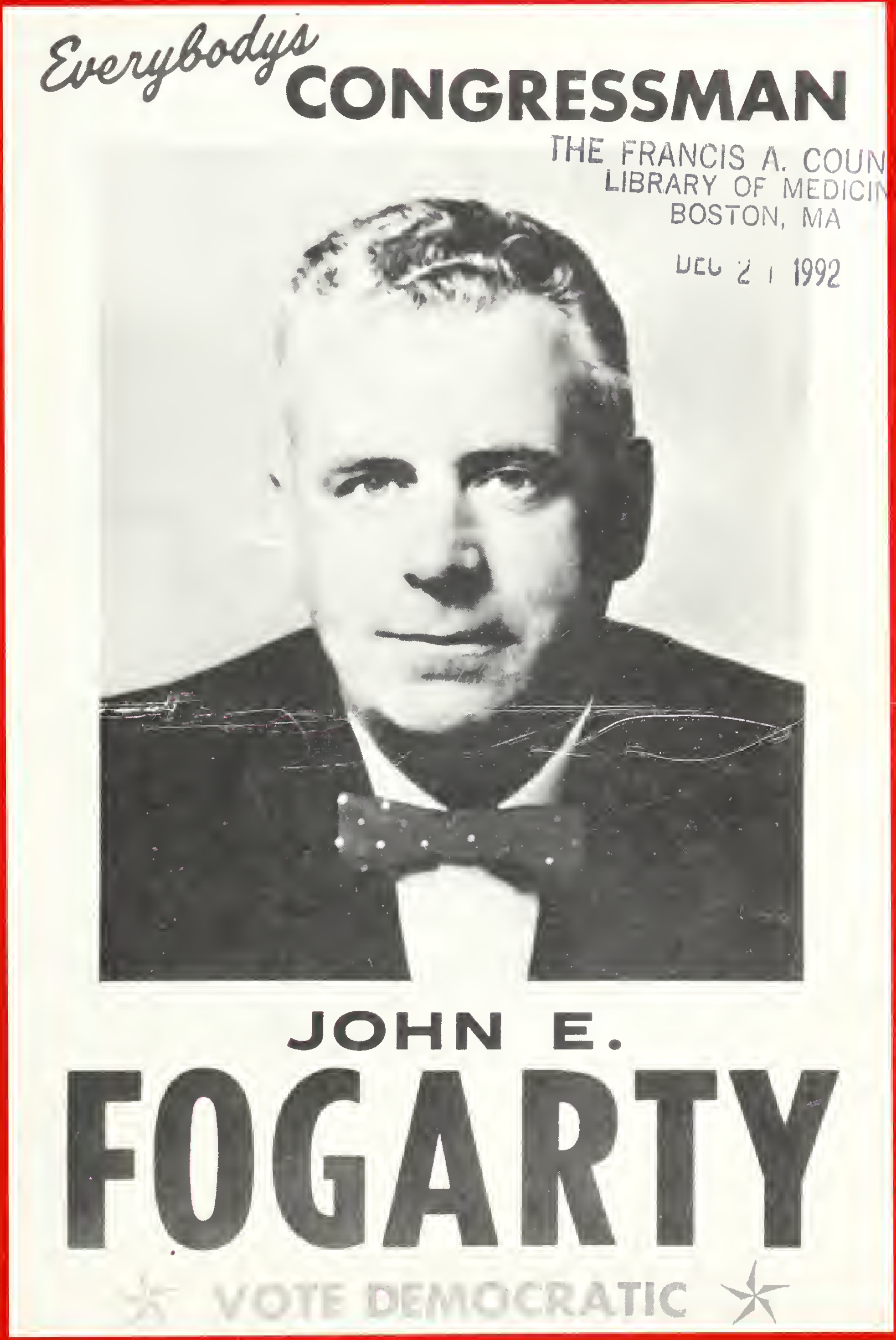

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Cover: A campaign poster for John E. Fogarty when he was seeking re-election to Congress.

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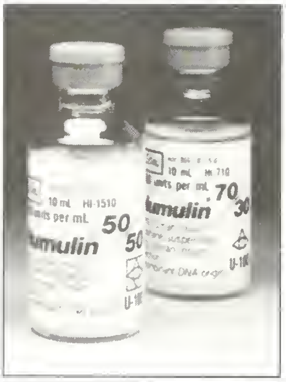

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COMMENTARIES

Fogarty's Life, Fogarty's Contributions

In the search for an architect to design our national system of medical research and a congressional leader to promote international health, the selection of a bricklayer from Rhode Island would have been unlikely. And yet, during this century, John E. Fogarty, master bricklayer from Glocester and member of Congress for 37 years, was our country's leading proponent of medical research and the chief legislative advocate and designer of the National Institutes of Health.

In his last few years of life, Fogarty became intensely committed to solving the immense problems of global illness and to the belief that in matters of health there were no national borders. Like Chekhov, he was certain that there was no such entity as a national science, just as there was no such thing as a national multiplication table; what was merely national, in his view, was no longer science. The Fogarty International Center in Bethesda, Maryland, represents an enduring monument to his vision in international medicine.

On the 25th anniversary of his premature death, *Rhode Island Medicine* respectfully dedicates this issue to the memory and contributions of our native son, John E. Fogarty.

The author of this biographic essay is Dr James Crowley, a lifelong student of Fogarty's accomplishments and the current president of the Rhode Island Medical Society.

Placebo

The use of a placebo, for most physicians, is a benign deception that is designed to exploit a patient's inate desire to recover. Its judicious use has been sanctioned by centuries of practicing physicians seeking to help when no specific medication is available to them. A divergent view, published in this month's issue of *Rhode Island Medicine*, considers placebos in a different light, however, particularly when they are employed in planned field trials.

The word *placebo* (Latin, I shall please) in a medical setting has its dim origins in the Latin translation of Psalm 116, line 9, which is commonly rendered in English as, "I shall walk before the Lord in the land of the living." While this is indeed a faithful translation from the Hebrew text, scriptural scholars, nevertheless, have noted that the particular verb form in this brief sentence is used only three times in the Pentateuch, each time signifying not merely someone walking, but someone walking as a pleasing sight in the eyes of the Lord. Accordingly, line 9 in the Vulgate Latin version (the official Bible of the Roman Catholic church) is substantively translated as, "*Placebo Domino in regione vivorum*" and in English, hence, as: "I shall please the Lord in the land of the living."

Psalm 116, by the 12th century, had become incorporated into the vespers chanted for the dead. It was a commonplace act of mercy for the church in that era to hire singers to chant this service for those dead with no family to render or pay for their service. Such purchased mourning services were eventually regarded as feigned, and the phrase *placebo domino* became emblematic of a deceitful, mercenary or insincere action. By the early years of the 19th century, the meaning of placebo had mellowed somewhat, losing its message of callous deception. About this time it was incorporated into the language of medicine to signify a medication designed to please rather than defraud.

In his brief essay, Rosenberg questions the morality of using placebos in field trials of new therapeutic agents. He contends that placebos may impair the intimate trust between patient and physician and, in some instances, may even risk the lives of the field trial participants.

The etymology and evolving meaning of placebo are clear, but how do we define an agent believed to be a placebo? One experimental physician had started hyperbolically that the history of medicine before the current century is the history of the placebo effect. Such a categorical statement, of course, ignores the handful of proven specifics such as morphine, quinine, and digitalis employed before the 20th century. But it does convey the critical importance of physician-concern and physician-confidence in the elements leading to a therapeutic success.

The essence of a placebo is not easy to describe. For example, a known headache remedy is given to one group of headache sufferers, with 62% declaring that it is an effective agent. Another group is given the same remedy, but in addition, is told that it represents a remarkable new drug; 89% of this second group declare that it is effective. Does this make the remedy a placebo? Or is there an additive process at work here, with a therapeutic effect now supplemented by a placebo effect?

Students of the placebo effect have noted that injections are more effective (in achieving a placebo effect) than capsules, which in turn, are more effective than pills. To paraphrase McLuhan, the vehicle seems to be the message. Even color seems to play some measurable role. Yellow placebo pills are more effective than white ones.

In defining a placebo, we begin with the stipulation that the patient has a disease, a symptom – or at least a perception of some abnormality – which causes him to seek relief. Second, the employed agent, in terms of this particular disease or symptom, must be biochemically inert. Third, the patient believes that the agent to be administered has some healing effect. (It helps the process immensely if the physician also believes in the efficacy of the agent, hence the requirement of double-blinding in objective clinical trials.) And lastly, the agent is administered within a healing context. Placebo effectiveness, then, requires a credulous person to seek remission of his symptom(s) within a health-rendering scenario. By this definition, the agent need not even be tangible; it might be some form of psychotherapy. Prayer, while possibly just as effective, would not fit this definition since it is not an integral element of a therapeutic contract between supplicant and healer. In this sense, prayer brings in a higher authority outside of the therapeutic contract. Whatever the authority, however, the lines between a placebo effect and an authentic therapy are quite blurred.

Stanley M. Aronson, MD

Season's Greetings

The Editorial Board of *Rhode Island Medicine* wishes its readers a joyous holiday season. May the new year yield happiness, health and a renewed commitment both to our patients and to our profession.

In this forthcoming new year of 1993, issues of *Rhode Island Medicine* will dwell upon:

- Disease prevention strategies in the elderly;
- Medicine and religion;
- Family medicine in Rhode Island;
- Volunteerism and the Rhode Island physician;
- Rheumatic diseases;
- Inner city medicine;
- The medical consequences of smoking;
- Medical education in Rhode Island;
- Pancreatic disease;
- Hypertension;
- AIDS in Rhode Island; and
- Movement disorders

Editorial Board

EDITOR'S MAILBOX

To the Editor:

Accepting your invitation, I submit the following (cf. *Rhode Island Medicine*, October 1992):

A cell of hematologists
A joint of rheumatologists
A family of practitioners
A chest of thoracic surgeons
A tissue of pathologists
An orbit of ophthalmologists
A scratch of allergists
A breach of obstetricians
A delegation of physician assistants
A brace of orthopedists

Robert Pearlman, PAC
North Scituate, RI 02857

To the Editor:

The recent issue of *Rhode Island Medicine* about tuberculosis (including the commentaries on famous people with TB) reminds one that tuberculosis has had an important role in the fate of certain fictional characters, also. Operatic heroines (and heroes) seem to have a high mortality. They often die violent deaths (poison, stabbing, strangulation, bullets, etc). Tuberculosis is the only fatal disease (infectious or otherwise) afflicting these heroic characters. Perhaps it was a socially acceptable disease both without stigma and not esthetically offensive. As our young Violetta or Mimi sings her final farewell who cannot shed a tear? Would we have the same reaction to the sight of her rising from her sick bed jaundiced and bloated from cirrhosis or cancer? To sing a farewell while dyspneic from emphysema might strain credulity too much.

In our times AIDS appears to be the universal disease producing similar kinds of human tragedies as did TB 100 years ago. AIDS, however, has a stigma in our society. Although there is much theater concerning AIDS it often has a "message." We are urged to be tolerant of different life styles or to alter our behavior. If our operatic heroine were to die of AIDS would we wonder whether she acquired it because of a lurid past, a present infidelity, IV drugs or a contaminated transfusion? Would we still regard her as the innocent victim of a capricious fate and shed our tears for her tragedy?

Finally we should consider whether the appearance of drug-resistant TB and the tragedies it is fostering offers an opportunity to an embryonic Verdi or Puccini to create another eternally beautiful work of art. Hopefully, effective therapy will be found and our incipient composer soon will be deprived of his subject matter.

Herbert Rakatansky, MD
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1. A. Morales et al., New England Journal of Medicine: 1221. November 12, 1981.
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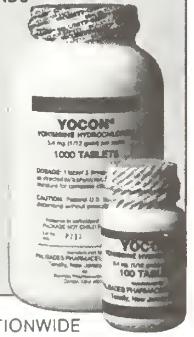

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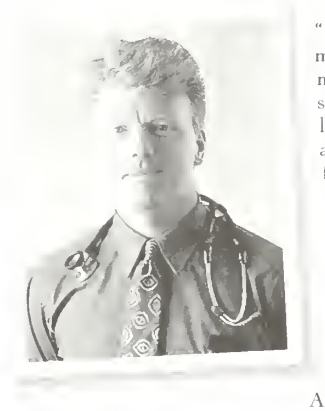

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Health for Peace: John E. Fogarty's Vision of American Leadership in Health Care and International Biomedical Research

A 25th Year Perspective

James P. Crowley, MD

> ***"Let our second American Revolution be a World War against disease."[44]***
>
> ***Rep. John E. Fogarty***

Twenty-five years ago, on Tuesday, Jan. 10, 1967, the United States lost the foremost champion of health care and medical research legislation that ever served Congress, Rep. John E. Fogarty, of Rhode Island's 2nd district. He first had been elected in 1940, the youngest congressman ever to have served in the House of Representatives from Rhode Island. Although only 53, he had served a remarkable 27 years at the time of his death. His remarkable legacy of legislation was all the more impressive when viewed in the context that Fogarty was elected with only a high school education and little political experience. His immense desire to achieve good for the people who had entrusted him to represent them was his most important asset.

After graduation from LaSalle Academy, Fogarty followed his father into the trade of bricklaying. Fogarty's later legislative efforts often were often said to reflect this trade. He endowed his efforts with the qualities of a good brick wall: a broad base of support and careful joining of each piece to achieve both solidity and permanence. This was typified by the gradual build-up of the NIH and, in particular, the Heart Institute, which he supported unconditionally. The products of this labor were firmly established and have persevered and remain strong 40 years later. While the focus of this anniversary review is the subject of his struggle to gain congressional support for international biomedical research, John E. Fogarty's remarkably successful role in the development of a premier national biomedical research program also will be examined closely.

James P. Crowley, MD, is professor of medicine at Brown University and director of Hematology at Rhode Island Hospital. He is the current president of the Rhode Island Medical Society and past president of the Providence Medical Association.

Fogarty's role in international medical research was less successful than his other efforts, primarily because of the lack of broad-based support. Ironically, the development of AIDS in the past decade has now supplied a broad base of support and in so doing has revitalized many of Fogarty's concepts for international cooperation in biomedical research. It thus is timely to reevaluate as well as to memorialize Fogarty on the 25th anniversary of his death.

Early Influences

Fogarty was born March 23, 1913, and for most of his adult life his home was on Saw Mill Road in the Harmony section of Glocester, Rhode Island. Fogarty followed in his father's footsteps, becoming an apprentice bricklayer after graduation from LaSalle Academy in 1930 and soon thereafter, a master bricklayer. After 10 years, he was elected president of the Bricklayers Union No. 1, which was the start of his political career. He was elected to Congress from Rhode Island in 1940, in large measure due to his labor backing.[1,2] He continued in the House of Representatives until his death on the first day of the 90th Congress in 1967. Fogarty had no involvement in the health field until 1947 when he was placed on the Appropriations subcommittee for Labor-HFW. He had requested to be put on the subcommittee controlling the Navy budget since Rhode Island had several major naval installations. In 1949, when he became the Labor-HEW Committee's youngest chairman, he already was deeply committed to the expansion of federal support for health programs, especially medical research. The explosive growth seen in extramural support from

ABBREVIATIONS USED:

AIDS: Acquired immune deficiency syndrome
FIC: Fogarty International Center
GNP: Gross national product
HEW: Health, Education and Welfare
HJ: House Joint (Resolution)
NIH: National Institutes of Health
NML: National Medical Library
PAP: Papanicolau (smear)
UNICEF: United Nations Children's Education Fund
WHO: World Health Organization

that time until his death (Table 1) attests to the success he had in finding congressional support for NIH. Early correspondence from medical experts, such as Paul D. White, MD, clinical chief of cardiology at the Massachusetts General Hospital in Boston, indicate that Fogarty made friends quickly with leaders in the medical field.[3] This was undoubtedly aided by the necessity that he bring these men and women before the subcommittee to testify. Fogarty's friendship with Paul White was so strong that when Fogarty suffered a coronary thrombosis in 1953, White became his personal physician. Fogarty also was greatly influenced by Frank Keefe, chairman of the subcommittee before Fogarty and who was a strong advocate for health programs.[4] Clearly Keefe served as Fogarty's primary role model as chairman.

Table 1 – Number and Amount of Research Grants Awarded by the National Institutes of Health, Fiscal Years 1940-70 (in thousands of dollars)

Year	Number	Amount	Year	Number	Amount
1940	13	61	1956	3,430	40,519
1941	12	78	1957	6,186	80,906
1942	12	78	1958	7,028	99,481
1943	9	49	1959	9,056	141,421
1944	5	53	1960	11,571	198,758
1945	9	85	1961	13,534	272,941
1946	79	892	1962	14,975	372,099
1947	335	3,458	1963	15,233	430,908
1948	1,042	10,150	1964	15,242	497,924
1949	1,130	11,274	1965	15,183	538,763
1950	1,529	13,671	1966	15,153	600,973
1951	1,695	17,130	1967	13,937	593,313
1952	1,798	18,599	1968	13,120	626,018
1953	2,084	20,936	1969	12,435	627,581
1954	2,855	29,951	1970	11,339	602,153
1955	3,256	35,163			

Source: NIH Almanac, 1975, Department of Health, Education, and Welfare (Washington, DC: US Government Printing Office, 1975).

Fogarty believed in close personal interactions with colleagues. At the time of his death his personal charisma was perhaps the most often mentioned influence by fellow legislators of his success in the field of health legislation. He was never pretentious, another fact much admired within and without Congress. His own listing in the Congressional Directory of 1960 states simply "John Edward Fogarty, Democrat, of Harmony, RI, elected in 1940, re-elected in succeeding Congresses." John Fogarty remained a family man throughout his career. He returned home to his wife and daughter virtually every weekend. Nor did he seek to milk his role for either publicity or social standing in Washington. The effusion of press releases from congressional offices helped make scrap paper Washington's leading commercial export, but Fogarty, "rarely issues a release, rarely grants interviews, does not routinely distribute his speeches to the press, and is a stranger to the city's social circuit"[5] said one prominent science reporter.

Fogarty disclaimed any particular personal influence that led him to be the premier advocate for health-related legislation in his time:

> "Nothing happened to me when I was a kid that made me decide that medicine has to be improved. It's just that I feel that as long as people are sick, something has to be done to make them better. The government has to give most of the help because there's no one else to give it. If kids are handicapped or sick and no one is going to try everything possible to help them, well, it just can't be that way."[6]

His desire to assist others on a personal level also is indicated by the large volume of "personal legislation" Fogarty introduced.[7] This type of legislation is used to gain relief for individuals with personal problems, for example, naturalization or immigration. At the time of his death, Congressman William J. Randall of Missouri, a fellow former bricklayer was convinced that at the hardships of seasonal unemployment and the bleak outlook a disabled man had were the primary experiences that motivated Fogarty's efforts in health and rehabilitation.[8]

Despite Fogarty's dedication, he was never a fanatic and understood completely the adage that politics is the art of compromise. He was always aware of the need for controlled, responsible growth, closely examining every appropriation and keeping overhead appropriations for grants to under 15%, which is remarkable in view of present research overhead costs that can be as high as 60%. He also was keenly aware of what the public wanted. At one congressional hearing he cited a Gallup Poll of 1954 that showed that 79% of the people approved federal expenditure of $100 million for cure and prevention of cancer and 64% said they would be willing to pay more taxes for these funds.[9]

Fogarty's zeal for health research clearly developed after his appointment to the subcommittee that controlled health expenditures combined with his keen desire to help individual citizens who had elected him. He was influenced by his association with medical leaders and his keen interest in medical issues. Eventually this same zeal would later extend to international health, due again, primarily to interactions with leaders in the World Health Organization.

Fogarty's Basic Program

Although Fogarty is remembered for his role in many areas, notably the rehabilitation of disabled children, he was dedicated primarily to biomedical research funding legislation in the House of Representatives.

"Some have gone so far as to call me a 'health zealot'. I accept that as a compliment. No single scientific battle has a greater claim on a man's zeal than the battle against disease."[10] Fogarty's emphasis on battle was deliberate. His energy and enthusiasm for the battle is evident in the myriad of bills he shepherded through Congress during his 27 years as a representative.

Fogarty's legislation touched the whole length and breadth of the health field – from basic and clinical research to delivery of primary care; from training doctors to building hospitals; from the care of infants to the care of the handicapped and the aged; from Rhode Island to the World Health Organization. Fogarty summarized his commitment to the importance of health in the life of each individual in his acceptance speech at the Lasker Awards ceremony of 1963:

> ". . . the life and well-being of a single individual is a richness beyond all value, a prize without price."[11]

Clearly, within Fogarty's broad vision of legislation, interventions to promote the well being of the individual citizen, medical research was the most important element. He said:

> "No one wants more than I to get ever better medical care to every American. More and more I am convinced, however, that research takes precedence over care. Medical care is locking the barn after the horse is stolen."[12]

Fogarty opened up the purse of the federal government for health research through his powerful influence as the chairman of the Appropriations Subcommittee for Labor-HEW. "The mainstream of medical research must be deepened and widened."[13] Under his guidance, the budget for NIH grew from $37 million in 1949 to $1.24 billion in 1967. Concurrently, the NIH grew from 2 to 9 institutes, growth that was very much influenced by the liberal political climate.[13a] As stated by James Shannon in 1966, at the Ninth Annual Gregg Memorial Lecture:

> "There was no unanimity in the Executive Branch of government at that time concerning the federal role in the advancement of medical research, and no firm conviction that expansion was warranted. This ambivalence, reflected in less than imaginative appropriation requests, provided a clear opportunity for the legislative branch to seize the initiative. Two extraordinarily able and dedicated members of Congress, both with deep and long-standing commitment to national health support, rose to the occasion. Senator Lister Hill and Congressman John E. Fogarty, through brilliant use of the appropriation hearings process, amassed evidence of research needs and opportunities in relation to major disease problems and won broad congressional concurrence for substantial increases. These two men and their colleagues, despite a more perceptive executive attitude, have since maintained a dominant influence in determining the levels of federal support for medical research. The nation owes much to their courage, devotion, and skill." [13b]

More and more I am convinced . . . that research takes precedence over care. Medical care is locking the barn after the horse is stolen.

Fogarty was aware, perhaps more aware than later congressional health advocates that:

> "One can't – in a literal sense – buy research progress. However, one can buy the probability of progress. This fact has guided our national investment in health research."[14]

Thus Fogarty's desire to increase the NIH budget year after year had this rationale. However, as will be seen later, funds were not only put toward the growth of existing programs but the start-up of well-planned new initiatives. Fogarty believed in an orderly expansion of programs, apportioning funds only ". . . when there is a sound opportunity for strengthening the medical research attack, and when that opportunity can be documented by convincing proof of the wisely planned program that will capitalize on the additional funds to be provided . . ."[15]

His pragmatic approach also included a dream of an unprecedented institution to advance the cause of human health worldwide. His goal was health and well-being for all persons, everywhere, forever. It was this broadly idealistic vision that kept Fogarty's programs exciting and compelling.

In his speeches on the floor of the House or at ceremonies, Fogarty would point out then recent medical achievements developed through research, such as the Salks' polio vaccine, new and effective mental health drugs, and of course, the ever-increasing lifespan of Americans. In his view, the last goal was the measure of the effectiveness of medical research to benefit the individual. In one telling interview, Fogarty recalled that in 1949 he met a young man who was walking with the aid of two canes.

> "I asked him, 'what's wrong with you?' He told me that he had multiple sclerosis. Well, I had never heard of it. I called up the Surgeon General and asked him what it was all about, how many people had it, what were we doing about it. He told me that almost nothing was known about it, and that we weren't doing anything about it. So, I got them $500,000 as a starter to get to work on it."[16]

Fogarty expresses his simple, pragmatic idealism in a speech at the Lasker Awards ceremony in 1963:

> "As we limit the span of uncertainty in the cause of death and illness and extend and enrich the span of life, we act in the highest ideal of government, in the service of the governed, and in the best tradition of public, private, and individual enterprise."[17]

So, in this spirit, Fogarty ensured through his legislative efforts an annual increase in funds for medical re-

Paul Dudley White, MD and John E. Fogarty

Congressman Fogarty (l) with Paul Dudley White, MD (c) and President Eisenhower

Paul Dudley White, MD, was the most well known physician of his day. He treated both President Eisenhower and Congressman Fogarty for their heart problems. White first saw John Fogarty at the Naval Hospital, Bethesda, MD on June 18, 1953. He noted a strong family history of heart disease and sudden death in Fogarty's paternal relations. Fogarty had been having symptoms of coronary disease since mid-May, and was hopitalized on June 9, 1953 at age 36 with an acute myocardial infarction. White saw him every few months thereafter. He urged Fogarty to give up cigarettes, which he did by October 19, 1953. Dr White also advised against rich foods and alcoholic beverages, advice Fogarty found difficult to adhere to. His cholesterol levels remained high, for example, 446 mg% on January 9, 1962. Fogarty found dieting particularly difficult. On November 21, 1963, White wrote in his record "He must change his way of life as to weight, exercise and relaxation." Dr White last saw him on January 18, 1966 when he noted Fogarty was "still extraordinarily lucky." On March 31, 1965, he wrote, "I am enclosing a copy of the letter I have just sent to Luther Terry about you, and also a memorandum for your conference in May with Pope Paul in the question of an international research program . . . I hope you will begin seriously to lose some weight and get back on the golf links – without a cart." Dr White heard of Fogarty's death on January 10, 1967. His file indicates that there was no autopsy. He noted that Fogarty had survived his first infarction 14 years before, and White presumed Fogarty's death was likely due to a second, massive myocardial infarction.

search through his career in Congress. This fiscal support was restrained only by the amount of researchers and the facilities available. In 1955 and 1956, this growth slowed a bit due to increasing problems resulting from a lack of good research scientists and research facilities; Fogarty, believing that increased funds would be ill-spent because the necessary facilities were lacking, chose not to provide those funds in appropriations.

> "If our money is to be wisely spent, planning must take into account that it is manpower, facilities, and money which are the ingredients for research progress, and not money alone. I believe that today the shortages of manpower and facilities restrict the level to which medical research can properly be supported by dollars . . . and I look forward to a concerted effort to resolve these shortages so that the total net investment in medical research can continue to increase."[18]

Fogarty introduced bills that provided federal assistance for construction of public health educational and research facilities (the Health Education Facilities Construction Act of 1957); made federal funds available for the training of teachers for the deaf and increased the salaries of certain federal employees including NIH personnel. Fogarty also increased NIH appropriations for training programs. In obtaining federal funds for the construction of health research facilities and training of health researchers, Fogarty ensured an adequate base of facilities and personnel for the vertical growth of medical research.

At the same time, Fogarty also gave attention to the horizontal growth of research, introducing legislation that would increase the breadth and depth of people aided. He prepared legislation that provided for the expansion of teaching and research in the education of mentally retarded children, the Rehabilitation Act of 1957, and introduced another to create a comprehensive health program in the United States. (This bill failed, however.) Still he doggedly believed that ultimate medical research was the most important part of his long-range goal to eliminate suffering; it was the means by which the elimination of disease ultimately could occur.

> "Our vast and ever growing medical research pioneering, and the way we are identifying and seeking new goals in our overall health program . . . is one of our most significant achievements as a people. Surely it typifies that higher responsibility, which we as a nation have never turned our backs on. . ."[19]

The growth in number of external research grants from 1940 to 1970 attest to Fogarty's commitment and support of biomedical research (Table 1).

His Legislative Style

Fogarty's success in the field of health care legislation was due not only to his dedication and sincerity but also depended heavily on his capacity to persuade his fellow legislators:

> "I believe in the public health program, and I am going to fight for the funds to make it successful. I am going to do in committee and on the floor of this House whatever is necessary to get adequate appropriations for medical research, and I urge you to support me in that campaign to raise the standards of health of the people of this land."[20]

He was able to gain broad support for his ideas. An idealistic tone always characterized his speeches on the floor of the House:

> "We are spending . . . only a pittance to meet the enemy within . . . (which is) our lack of knowledge concerning our fundamental physical and mental processes and uncertainties about disease mechanisms."[21]

His arguments also were broad, reasoning from many perspectives; political, economic, national security, as well as humanitarian. It was the diversity of his arguments that helped gain him broad support for health measures. The way Fogarty presented his ideas left his audience with few choices. One was either for or against the health of the nation and the world. Put in this way, there were few congressmen who would go on record as being against him. Fogarty often called for roll call votes, especially if it seemed that the vote would be close. He also appealed to those who viewed America as the bastion of freedom.

> "And it is . . . shortsighted to fail to realize the vital part which the health sciences can play in the international struggle to eliminate the conditions of impoverished and disease-ridden existence on which Communism thrives in many parts of the world."[22]

Fogarty, for his appropriations bills, would try to convince others that his committee had the definitive knowledge of what funds were necessary:

> "Mr. Chairman, this has been an unusually difficult budget to deal with. The administration, by submitting a completely unrealistic budget and by minimizing the needs of medical research, placed the committee in the position of having to examine the needs of NIH with unusual care. The hearings were more extensive, detailed, and searching than in my 10 years of experience as chairman of the committee. All of the members of the committee worked hard and effectively."[23]

One can't . . . buy research progress. However, one can buy the probability of progress.

Through his usual broad base of arguments, sound fiscal judgment, and humanitarian appeal, Fogarty usually was able to persuade his fellow members in Congress to support his bills, the ultimate achievement of the good legislator.

Fogarty was also a good legislator in another traditional regard: that of representing his constituents. Fogarty proposed much legislation that would assist Rhode Island – such as a construction of a hurricane barrier in Providence. He, perhaps facetiously, introduced a bill to locate the United Nations in Newport, Rhode Island. He thought it would be a good place since Aquidneck was the Narragansett word for "peace". He also took advantage of his position to use legislation to promote the health of Rhode Islanders in particular. His bills to provide grants for construction of research facilities aided the construction in 1958 of the George Research Center at Rhode Island Hospital, an extensive cancer research facility, the highly advanced and innovative premedical program at Providence College in 1960, the Medical Research Laboratory at Brown University in 1963, and the construction of the health science building at the University of Rhode Island in 1964. The bill giving funds for these teaching facilities led ultimately to his goal for a medical school in Rhode Island based at Brown but involving all the principal institutions of higher education, a goal Fogarty had desired but did not get to see before his death. His support of increased hospital construction funds saw improvements at Rhode Island Hospital, Miriam Hospital, Newport Hospital, the Ladd School and many other facilities in Rhode Island.

Many federal programs also were first piloted in Rhode Island and thus first aided Rhode Islanders. For example, the NIH pilot project for cervical smears testing for cancer, the so-called PAP smear test, was initiated in Rhode Island soon after its introduction in Tennessee. Federal health programs combined with the extensive use of federal funds for construction to make Rhode Island one of the best funded states in the country with respect to health care facilities and education during the time that Fogarty was in office.

During a campaign speech over WEAN radio in 1962, Fogarty, discussing increased federal funding of health programs, said:

> "I am happy to have played a part in changing that picture. Federal support for medical research jumped from less than $3,500,000 in 1946 to more than $738,000,000 in 1961. I believe that the people of Second Congressional District in Rhode Island agree that this is progress. In seeking their support for reelection, I am asking them to give me the opportunity to continue to promote legislation which will cause that

> progress to advance."[24] "If I am reelected, you may be sure that I will continue to oppose any suggestion of retreat or cutback in funds for research in the health sciences."[25]

Fogarty was now reelected 13 consecutive times. Through his continually growing seniority, he was able to sustain the dramatic growth in support for the health field that occurred under his supervision and guidance.

Championship of Medical Research in Congress

Fogarty was highly practical in developing a broad base for growth of federal support in the health field. His reason for advocating congressional support for medical research was that it was a means of reducing human suffering. Though this was always the main argument, Fogarty used persuasive arguments that medical research also was a means towards other goals. He used all of the benefits of medical research in his arguments for appropriations and legislation. This engendered broader support for research measures from his Congressional peers, but he firmly believed in his own arguments that the value of the other benefits, which would accrue from an investment in medical research, were important.

> "I submit that investment in medical research, aside from the unending humanitarian benefits, is an economical investment in life."[26]

This statement had a great many ramifications at the practical level, but primarily, Fogarty argued that:

> "Research is the only means we have for reducing the growing federal burden of medical care costs..."[27]

Being on the appropriations subcommittee for HEW, Fogarty intimately knew how much was being spent on care and hospitalization for patients with various disease types and treatment of various illnesses. He often argued that if research could cut the need for treatment, then the investment in research would be returned in decreased federal medical care costs. This argument remains valid today.

John E. Fogarty while serving during World War II with the Seabees.

Fogarty also saw medical research as benefiting the defense. The early 1950s was the time of the Korean War and the intensification of the Cold War with the Soviet Union. Improved health of the population would increase the number of health personnel for the military. Fogarty was always able to point to the number of persons rejected by the draft board in World War II because of chronic illness. Medical research could provide protection against bacteriological and radiological warfare, and it could provide answers to new problems of high-speed, high-altitude flight, field treatment of injuries from newly developed weapons, etc. With all these points, Fogarty argued for medical research as a way of strengthening the military and national defense, and therefore as a major instrument of national security.

For the national economy, medical research would place more people into a productive status, both by reducing the incidence of chronic disease, putting those people into the labor force, and by reducing the amount of disability of those already in the labor force. Fogarty used estimates of potential gain in GNP, and therefore, tax revenue when arguing for medical research. Fogarty never lost sight of the primary objectives of medical research: to reduce the amount of human suffering, to reduce the incidence of dread disease, and to create a healthier future for all people.

> ". . . medical research is a revolutionary force. It broadens horizons for all persons living. For the future, it promises generations bred to a new splendor. Truly, in terms of what it can add to the sum of human goods, no limits can be set on medical research."[28]

These primary goals are what led Fogarty to transcend defense, in a narrow sense, to a desire to extend the benefits of medical research from national to international boundaries. With the Korean war, there came worldwide recognition that the world political area was not soon going to improve, at least not with the state of affairs as they were. Fogarty, who was well versed in foreign affairs, envisioned the attainment of world peace through health and international research.

> "Time and again it has been demonstrated that the goal of better health has the capacity to demolish geographic and political boundaries and to enter the hearts and minds of men, women, and children in the four corners of the earth. It is an issue which served as a forceful reminder of the oneness, the essential brotherhood of man. For pestilence and prolonged disability and premature death, wherever they may occur, are tragedies which strike a responsive chord in man and his governments. There is sympathy for suffering in human terms. There is recognition of the interdependence of nations in terms of transmissibility of disease. There is concern for the burden disease places on a nation's social and economic strength. And there is widespread belief that the nations of the world can and must share their knowledge and other resources so that people everywhere may have the blessing of better health, and through health, may move forward to new levels of peaceful productivity."[29]

American Leadership in International Biomedical Research: The Ultimate Goal

As a master bricklayer, Fogarty planned a solid base for his vision. These powerful arguments appealed to a broad range of interest in Congress but eventually ran into opposition particularly from the Administration. Humanitarian, political and economic interests all played a part in Fogarty's growing certainty of the need for American leadership in international medical research:

> "The significance of research on an international scale was called sharply to my attention last May in Geneva, Switzerland. As chairman of the committee considering the health appropriation of the Department of Health, Education, and Welfare, I had an opportunity to attend the 12th World Health Assembly of the World Health Organization last May as a delegate of the United States. This Assembly considered a comprehensive report on international medical research which recommended that WHO become much more active in stimulating and supporting medical research. With leadership provided by this country, WHO decided to expand its medical research efforts. We should certainly support this program, as well as our own international medical research activities."[30]

Fogarty's foremost reason for wanting international medical research were the benefits that would ensue to the people of the United States and all the world.

> "I have always recognized . . . that just as disease knows no national boundaries so also the benefits of medical research and indeed research itself can know no boundaries."[31]

Research is the only means we have for reducing the growing federal burden of medical care costs . . .

The benefits here were two-sided. First, the world would benefit; the US had become a bastion of medical knowledge and the world leader of medical care. As well, the US had the funds and the facilities to mount such an international effort. Research directed to health problems of developing countries could solve many of them, reducing much suffering throughout the world. Besides the obvious humanitarian aspect, it was hoped that US assistance would sway countries away from Communism.

> "We need their (developing countries) political and strategic support, or at the very least, their abstinence from assisting our enemies. We want them to develop values and institutions that will help to strengthen the cause of democracy. . ."[32]

The other side of the coin was that the US would gain valuable knowledge from international research. The profile of illnesses in developing countries was in transition from primarily infectious to chronic, non-infectious diseases. Study of the development of chronic disease in a developing nation's population might allow its understanding and perhaps its mitigation in the United States. As Fogarty said:

> "In the health field, our international programs more properly can be characterized as enlightened self-interest, since it can be amply demonstrated that we receive as well as give."[33]

The US would also benefit in knowing how to fight the infectious diseases of the world, for:

> "In the wake of technological advances, the world has shrivelled in size. The most distant places are only hours apart. When a child in Calcutta falls victim to cholera or a worker in Mexico contracts smallpox, the mothers of Providence and Kansas City and Los Angeles must be concerned."[34]

Fogarty argued for international medical research also on economic grounds. If people of other nations were to become healthier, then US trade with those nations would increase since they could step up the pace of development. The health of other nations has a direct impact on the US economy. Better health of people in developing nations also would allow them to better care and produce for themselves, thereby decreasing the types and amounts of direct aid the US would have to give to these nations.

Besides decreasing the amount of aid the US would need to give to developing nations, improving worldwide health would also achieve positive economic benefits for the US; developing nations, once they were provided with health and thence some level of well-being, would become markets of many US products and technologies. This would greatly increase the United States international economic power.

Then, of course, there was the political argument, that of creating world peace.

> " . . . all of us know that to advance the cause of freedom we must do much more than help build sound economies. The spiritual, intellectual and physical strength of people throughout the world will in the last analysis determine their willingness and the ability to resist Communism."[35]

An international effort in medical research, unlike military aid, would be a symbol of good will from the United States, one with no strings attached (though hopes of creating allies are not to be ignored).

> "Here is a great opportunity . . to show the people of the world that we are concerned with them for their own sake – not to master them but to master their great enemy, disease."[36]

Medicine and health are areas without political boundaries and few ideological differences. Medical research provides a basis for worldwide cooperation. The benefits would help to make people healthier and therefore happier and less dependent.

> " I think that this matter of expanding research is one – perhaps the one – truly global effort in which all nations can and will join as real partners."[37]

As stated so well by Felix Marti-Ibanez, MD,

> "Disease prevention by the creation of conditions that will improve physical and mental health – pure air, wholesome food – will lead to the creation of healthier mentalities and clearer thinking, which in turn may contribute to a world peace based on the absence of fear and on love for life. Wars are conceived in men's brains before they are fought on the battlefield. Healthy, happy men of the future might create a peaceful, happy world."[37a]

These ideas led Fogarty to make appropriations to NIH for grants to foreign scientists and ultimately to draft and propose a bill, HJ Resolution 698, in September 1958 (85th Congress) that would establish in the Public Health Service a National Institute for International Medical Research, the "Health for Peace" bill. Before examining this critical piece of legislation we must look to the economic and political context into which the bill was introduced. Unfortunately, external factors, rather than the merits of the bill, determined its course through Congress.

The Times: Cold War

The post-World War II era saw an increasing emphasis on international cooperation to maintain world peace. There then developed, rapidly hastened by the Korean War and the Cold War, a schism of the world into two camps: democracy and communism. The ideal of freedom and democracy was championed by the United States. US foreign policy became extremely important in this new world where a foreign nation had to be for or against democracy, viz the United States.

During the time when Fogarty's thinking advanced toward major support for international research, President Eisenhower had been a major advocate of foreign aid and mutual security. He favored the Marshall Plan to redevelop Europe and also the Point Four program of Truman to aid developing countries. In fact, the issue of foreign aid was one of Eisenhower's platforms for his reelection in 1956.[38] The spirit of these programs, as well as that of the Mutual Security Act of 1958, and indeed Eisenhower's whole perspective on foreign aid, was predominantly that of technical and economic aid. Foreign aid was critical to Eisenhower; in all his major speeches of 1958-59, he bracketed both foreign aid and reciprocal trade agreements as vital tools of American foreign policy.[39] They were tools of foreign policy; the motives being political and economic, not humanitarian.

But this is not to say that Eisenhower neglected the importance of science in the world. Quite the contrary, he advocated sharing of information, but it was in the context of "Scientific Cooperation with our Allies".

> "A program of Science for Peace might provide a means of funneling into one place the results of research from scientists everywhere and from there making it available to all parts of the world."[40]

Eisenhower didn't have medical research topmost in his mind in this Science for Peace concept. It was the theme of "Science for Peace" that Fogarty played off of in subtitling his bill the "Health for Peace" legislation. The key difference between Fogarty's and Eisenhower's intent was in the planned dissemination of technical knowledge through a perspective of foreign policy. A president with strong ideas about foreign policy wanted all matters dealing with international affairs under control of the State Department. Fogarty's ambitious plan of international funding and mutual cooperation among health scientists throughout the world did not accept this restriction.

Eisenhower's grasp of foreign affairs was not matched in his domestic performance. A major recession occurred in 1958, slowing the economy. This meant that the fiscal budget would be tighter. Yet, Eisenhower's submitted 1958 budget was higher than for 1957.[41] This created an open-season for budget-slashing Congressmen. Congress was forced to do what the president had failed to do – create a workable budget. For congressmen, whose first loyalty is to their constituents (especially in an election year), the easiest target for the budgetary axe was foreign aid and expenses dealing with foreign countries.

An additional consequence of the recession in 1958 was that international trade slumped. This resulted in a strain on the international balance of payments.

> "Our surplus from foreign business transactions has in recent years fallen substantially short of the expenditures we make abroad to maintain our military establishments overseas, to finance private investment, and to provide assistance to the less developed nations. In 1959 our deficit in balance of payments approached $4 billion."[42]

John E. Fogarty (r) with John F. Kennedy. Kennedy's election helped Fogarty to obtain more funds for international biomedical research.

That meant that the amount of soft currencies available was decreasing or gone in many countries. It was in this uncertain political and economic background that Fogarty introduced his legislation calling for a new Institute for International Medical Research.

Health for Peace: The Bill and the Battle

Fogarty's bill provided for more than a new institute within the NIH. The major points of the bill included:

1. Authority to the President, HEW secretary, and mostly to the Surgeon General, to strengthen existing programs of international medical research and to develop new ones for deficient areas,
2. Creation of a new institute at the NIH dealing specifically with international health, the National Institute for International Medical Research,
3. Creation of a National Advisory Council for International Health Research, and,
4. Authorization of $50 million to carry out the provisions of the bill.

This bill was submitted as House Joint Resolution 698. A companion bill was introduced in the Senate by Senator Lister Hill.

These bills called for the authority and mechanism for the delivery of the research program be vested in the NIH, with close control by the Surgeon General. Effectively this would keep international medical research support away from the fluctuating pressures of foreign policy and the State Department. Research could be provided in those areas and fields where it was most needed and in which the best researchers were available. Projects would be determined on their scientific merits and not on political considerations. Fogarty saw this latter point as critical.

The other points were also important to him. The creation of an institute would ensure the longevity of the program and after a statement to other countries of the US's sincerity in providing international medical research. An advisory council would provide quality assurance in screening and selecting projects to be funded as well as assist in the dissemination of new medical knowledge. And, of course, the authorization of funds would allow research projects to be undertaken easily and anywhere. The Institute and its funding were the items that Fogarty saw as important to the effective implementation of the international medical research by NIH.

HJ Resolution 698 was not acted upon in that session. But, encouraged by the words of President Eisenhower in his 1959 State of the Union address

> ". . . we shall continue and expand our campaign against afflictions that now bring needless suffering and death to so many of the world's people. We wish to be part of a great shared effort toward the triumph of health."[43]

Hill and Fogarty resubmitted their bill. In speaking of the resubmission on May 6, 1959, Fogarty stated:

> "Let our second American Revolution be a world war against disease."[44]

The bill was referred to the Committee on Interstate and Foreign Commerce, chaired by Rep. Oren Harris. Fogarty, however, did not wait for its hearings to speak out about the bill. On the floor of the House he spoke at length about international medical research in general:

> "Thus there are four major reasons for the expansion and strengthening of our international health activities. The first reason is humanitarian: as a nation, we are deeply committed to recognizing the dignity

> of the individual and to doing everything we can to enhance his rights and opportunities for a happy and productive life. The second reason is economic: in terms of our investments abroad and our purchase of the products of other nations, better health among the people of the world has a direct bearing on our own national economy. The third reason is political: Health programs provide an unparalleled opportunity for education in the true meaning of the democratic way of life. The fourth reason is, if you will, selfish: We have much to learn from other nations and much to gain from both the exchange of health knowledge and the participation of all nations, according to their capacities, in collaborative efforts to acquire new medical knowledge and to increase our ability to apply that knowledge in medical and public health practice."[45]

and about his and Hill's bill in particular:

> "The proposed bill is a sound legislative measure because it provides for a scientific program, administered through scientific means, acceptable to and workable within the framework of the international scientific community, and valid as a method of achieving international cooperation in research, research training, research planning, and the interchange of research knowledge."[46]

Fogarty maintained his broad base of arguments and waited patiently for the bill to move through committee. Occasional notes of despair occurred:

> "The opportunities for leadership and for productive interchange are knocking at our door, but some of us appear afraid to open it.[47] We cannot let time slip though our fingers while we ponder a course of action whose validity and promise have been fully explored and remain substantially unchallenged."[48]

The House committee hearings were held on July 21-23 and August 4-6, 1959 with an impressive list of people from the political and medical fields giving testimony. Most notable were the Administrative witnesses. Arthur Flemming, Secretary of the Department of HEW was probably the witness, who voicing the Administration's ideas, was most detrimental to the bill. His testimony had a two-sided edge. On the one hand, he stated that "we want to make it clear that we are in accord with the purposes and objectives of this bill."[49] But then, Flemming proceeded to list the revisions to the bill advocated by the Administration, which had been previously summarized in a letter from Flemming to the Senate Committee on Labor and Public Welfare, which held hearing in the Senate on SJ Res 41:

> ". . . We believe that a mandatory provision for the establishment of a National Institute for International Medical Research is unnecessary and also unsound in that it would introduce undue rigidity into the structure of the program and make more difficult the evolution of the most desirable patterns and structure for administration of the program. *We strongly urge deletion of the specific statutory authorization* of an appropriation of $50 million annually in section 14 of the bill . . . In conclusion, we recommend enactment of this bill *if amended along the lines suggested above* and in the enclosed memorandum . . ."[50]

"The opportunities for leadership and for productive interchange are knocking at our door, but some of us appear afraid to open it."

The revisions effectively change the bill in all of its points. International medical research would not be in the firm control of scientists but would be subject to State Department policy decisions. As well, the provision for an institute and for appropriations would be dropped, the items which Fogarty saw as the basic means of implementing the research.

Dr Leroy Burney, the Surgeon General, testified in accord with Flemming:

> "Secretary Flemming . . . has already indicated our general endorsement . . . and has suggested a number of amendments. With respect to the provisions of the bill itself, I have nothing further to add..."[51]

This agreement with Flemming seemed to be merely out of respect of the Administration's position, for later in his testimony he spoke against existing programs and endorsed expanding international medical research:

> "Although these activities relating to international cooperation in health and medical research represent substantial contribution, they are admittedly limited in scope and volume in comparison with the ultimate potential for constructive action in this field. The enactment of legislation specifically authorizing participation in, and providing for the mobilization of US research resources toward this end would contribute greatly to the future planning and conduct of such activities by the Public Health Service and by other agencies of our Department."[52]

Despite this endorsement he nevertheless maintained the Administration position that the bill be radically revised. Considering the issue of where to place authority for the measure, whether with the President or primarily with the Surgeon General, was recognized on both sides as a substantial issue. Would a new institute affect US involvement in other agencies such as the WHO? Would increased involvement in research denote a possible increase in US involvement in other areas? There even were questions concerning the research itself. Would US sponsorship of research stop the development of domestic research programs in other countries? Would other countries approve or resent their imposition of US standards of research upon their own countries? Would an emphasis on research draw medical workers away from the area of medical care? These questions are examples of why the Administration felt the medical research program should be handled as any other international program – by the President and the State Department.

Regarding the authorization, the Administration saw the research program as a way of using some of the mounting sums of foreign currency in other countries, which were being acquired primarily through the sale of agricultural products by the US to these countries. This, though, may not have been a valid point since, as previously stated, the US was starting to have balance-of-payment problems in some areas.

No doubt a final major reason for Flemming's lack of support was that he himself was working on a different approach to the issue of international health. Earlier that year, Flemming originated correspondence with other Administration members requesting the establishment of a committee on international health policy. This committee would be interdepartmental, including people at the Cabinet and Assistant Secretary level and spanning many agencies and departments.[53] It was planned that the committee will help to assure that the overall US international health program is planned and conducted as a consistent, comprehensive whole, with maintenance of close cooperation between the agencies concerned.[54] This committee actually did come into being, and was formally recognized on January 16, 1960 as the Interdepartmental Committee on International Health Policy. No real actions were taken by the committee at its one and only meeting, and it was soon dissolved in 1961 with the departure of Flemming.

"With elimination of the institute and authorization, there was no power granted nor idea expressed that did not already exist."

Lacking the support of the Administration, Fogarty's bill eventually got caught up in committee deliberations. Support from others was not strong enough. Fogarty had the support of many Congressmen – there were 5 Representatives who submitted nearly identical bills in the House and 26 cosponsors of Senate Joint Resolution 41. Outside the Congress, many leading research scientist were in favor of the bill. Dr Paul D. White, speaking about the current type of programs and specifically about international congresses, said:

> "Although these congresses have a vital importance because they bring together the special worker in important fields of medical research . . . the intervening years aren't adequately taken care of. In other words, between congresses we settle down to a much less active period of interest, and work in a desultory fashion."[55]

White was greatly in favor of the proposed bill, which would maintain the cause of medical research worldwide continuously. Other notable scientists in favor of the bill were Drs Howard Rusk, Sidney Farber, and Michael E. DeBakey.

This support from the medical field could not counterbalance the opposition from the Administration. Also, support from the officials at NIH was lacking; this lack of support seems rather surprising since it was they who would be gaining and running the new institute and handling the new funds. Dr James Shannon, director of NIH, advocated more a status quo or only modest increases in international medical research:

> ". . . I feel that due consideration should be given to strengthening existing patterns and mechanisms such as exist in the area of health and medical research rather than attempting to impose a single monolithic pattern of coordination which may emphasize form rather than substances.[56] It is our professional judgement that *relatively small quantities of money, supplementing funds available* from other national sources, can mean the difference between a very vigorous medical research program in many areas as opposed to one that proceeds at a very slow pace."[57]

And so, the positions towards Fogarty's and Hill's bill were mixed. The Administration, the State Department, Secretary Flemming, and NIH Director Shannon were negative. Within Congress, they were mixed since Congress was in a general budget-cutting mood. From the outside – medical scientists and advocates – feelings were clearly positive.

Despite this mixed basket of support, the bill passed the Senate with only the authorization level reduced from the requested $50 million down to $10 million. Unfortunately, Fogarty's legislation was held up in House committee until the end of the session. Rep. Oren Harris, in the press release announcing that the committee would not take any further action on SJ Res. 41, said that testimony had revealed a number of points at issue requiring further clarification.

Fogarty resubmitted the bill Res. 41 again in the next session. Early in the session, on March 10, 1960 Rep. Kenneth Roberts (D-AL), chairman of the health and safety subcommittee reviewed SJ Res 41 and submitted a clean bill HJ Res 649 which was the committee amended form of HJ Res 41. It was basically in accord with the Administration's suggested revisions, as proposed by Flemming, though retaining the same objectives and spirit as SJ Res 41. The principal differences

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John E. Fogarty (l) as a Congressional delegate to the World Health Organization assembly. Melvin Laird, an Ohio Congressman is at right. The man in the center is unidentified.

between HJ Res 649 and SJ Res 41 were:

> "Senate Joint Resolution 41 provides for the establishment of a new institute at the NIH for the purpose of promoting international health research ... Senate Joint Resolution 41 would vest in the Surgeon General exclusively, the powers proposed to be granted by this legislation and would authorize the appropriation of $50 million annually. . . House Joint Resolution 649, as amended in committee, does not provide for the establishment of a new institute . . . It would grant certain powers to the President for the purpose of advancing the international status of the health sciences in the United States ... It would not specifically authorize new appropriations to carry out the purposes of this legislation but, with respect to the Presidential authority, would aim at utilizing foreign currencies and credits for these purposes."[58]

Lengthy House floor debate revealed some problems with the Roberts bill. With the elimination of the institute and authorization, there was no power granted nor idea expressed that did not already exist. Roberts defended the bill saying that it would solidify and restate the objectives and intentions of the United States with regard to international medical research. Attention also was given to the issue of the use of foreign currency for research.[59,60] The major point dealt with the longevity of a program based on the availability of soft currencies. It was already becoming evident that US balance of payments were becoming problematic. As well, acknowledging that soft currencies were largely based on agricultural sales research would eventually lead to healthier and more productive peoples, who would then need less agricultural assistance, and so less soft currencies would be generated for research, even if the need for research remained.

Yet, despite the problems with the bill, it passed on a roll call vote with 259 yeas, 114 nays, and 58 abstentions, to become Public Law 86-610 – the "International Health Research Act of 1960." The reason for its passage was well summarized by Fogarty's comments:

> "Despite my disappointment with the specific terms of the present HJ Res 649, the necessary consequence of compromise the fact that such a bill has been favorably reported in time for definitive action in this Congress is a considerable victory. A victory from which I firmly believe the Nation – indeed the world – stands to benefit. I am convinced, however, that the specific authorities conveyed by House Joint Resolution 649 are not the matter at issue here today. I believe the important action that will result from the passage of this bill will be the explicit expression of this House that the United States does have a substantial stake in the furtherance of the health sciences through the conduct and support of medical research overseas and in collaboration with other countries."[61]

In 1961, Rep. Seymour Halpern introduced a bill, NJ Res 870, to amend the "International Health Research Act of 1960" to establish a National Institute for International Health and Medical Research and for other purposes, including setting some sort of authorization. It's not clear whether Fogarty had a hand in his bill, but no action was taken.

Despite the drastic changes made in Fogarty's original bill, there was still much benefit from the final law. This is due in large part to the purposes and spirit of the bill having remained – to foster international cooperation in the medical research. Expenditures on international research through other departments and the WHO grew quickly. Perhaps this growth was aided by the advent of a more favorable Administration with President Kennedy.

> "During fiscal year 1962 I am informed that the Public Health Service expended approximately $30 million in support of a variety of international research and training activities."[62]

Even though this may have differed in kind and fell short in amount compared to Fogarty's intent in HJ Res 370, it still represents a significant achievement by Fogarty in promoting international medical research.

The World Health Organization

While the battle slowly ensued in Congress over the "Health for Peace" bill, Fogarty was personally introduced to international health occurring through the WHO. In January 1959, Fogarty wrote to the Speaker of the House asking to be designated as one of the two delegates to the assembly for that year. He was appointed by the speaker, Sam Rayburn, and attended the Assembly in May 1959.

In his speech at this assembly, Fogarty advocated an increased emphasis on investigations and research by the WHO.[63] On the basis of a $300,000 US grant extended to WHO at the 11th World Health Assembly in 1958, and with advice from US research leaders, WHO prepared a plan for intensification of its role in the international stimulation and coordination of medical research. Indeed, as a US delegate, Fogarty must have had no small part in this.

Fogarty was a recurrent delegate to the World Health Assemblies, attending those of 1957, 1959, and 1961-1966. At these World Health Assemblies, Fogarty met with international health officials and also became acquainted with worldwide health problems. As Fogarty said after attending the 12th World Health Assembly:

> "The events of the past 2 weeks have strengthened and solidified my conviction that there are great humanitarian advances to be achieved by international collaboration in the health field, and that such collaboration at the same time fosters the kind of understanding among nations and peoples that can lead to a lasting peace."[64]

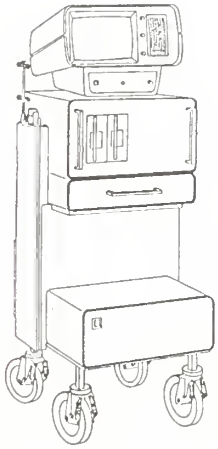
Fogarty did not attend the 13th Assembly in 1960 but served as a US delegate for the third time in 1961. He went with the spirit of cooperation which Kennedy had instilled in the people of the US in his 1961 inaugural address:

> "To those peoples in the huts and villages of half the globe struggling to break the bonds of mass misery, we pledge our best efforts to help them help themselves . . . not because the Communists are doing it, not because we seek their votes, but because it is right. If the free society cannot help the many who are poor, it can never save the few who are rich."[65]

By this time, the International Health Research Act of 1960 had been enacted, but far short of Fogarty's intended goals. In his address to the 14th World Health Assembly, Fogarty says of the US contribution international research that:

> "I am not satisfied personally with the progress that is being made. I believe more should be done and I shall exercise every means to see that it is done."[66]

This in spite of the increased funding the US gave for international research: $5 million in appropriations in 1961 for the general expansion of international medical research under the authority of the Surgeon General, and a $500,000 contribution to WHO for research. Fogarty told the assembly to look forward to more support of the WHO by the US through his "Health for Peace" legislation, but simultaneously he called for the WHO to step up its own support for and involvement in research. Fogarty was thus fighting his war against disease on many fronts – domestically through legislation and appropriation to NIH, WHO, UNICEF, and others and internationally through addresses at World Health Assemblies and interactions with foreign health officials.



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Fogarty continued to serve as a Congressional delegate to the WHO for the years 1962 through 1966. In each of the addresses Fogarty made during these assemblies, he had at some point advocated continued expansion of research activities. He also urged clinical aspects of health programs, especially in 1965 and 1966. For example, in 1965 he emphasized greater efforts toward the eradication of communicable disease, especially malaria, polio and smallpox. These diseases had been eradicated in the US, the rewards of research. So, the idea of clinical research and medical care was joined with the push for basic research in Fogarty's WHO addresses. WHO's research activities did expand, in large part through the aid of the US. This, combined with the international activities of the PHS, equalled a substantial US involvement in international medical research.

A New Direction

The increasing emphasis on clinical aspects of health programs in Fogarty's later World Health Assembly remarks was actually a belated emphasis on health care, which Fogarty had been advocating in the United States from the early 1960s. Fogarty had never been in favor of research for the sake of research but supported research as a path to better health. Still maintaining his advocacy of research, Fogarty expressed the idea that the clinical aspects of health care need to be developed more fully, for

> "research results which are found in the laboratory but which never reach the patient are of interest to science, not to humanity. The problem before us today is to bridge the gap between the laboratory and the patient."[67]

As early as 1961, with domestic research assuredly growing due to Fogarty's chairmanship of the appropriations subcommittee, and international research developing as quickly as possible, Fogarty turned to other areas of concern. In a speech before the National Federation of Catholic Physician's Guilds in 1961, Fogarty outlined these deficient areas:

> " . . . the development of means which will reduce the time lag between new discoveries and mass application, and finally the control of health hazards in the environment."[68]

To fill these needs, Fogarty acted through legislation and appropriations. He proposed bills to give grants for construction of educational facilities (Health Educational Facilities Construction Act of 1961) and to give grants for educations in fields of medicine, dentistry, nursing and various therapies (audiology, speech pathology, mental health, etc). He also proposed legislation that would augment the nation's library facilities, with special emphasis on medical libraries. Fogarty allowed funds for NIH to set up a number of regional clinical research facilities.[69]

How This Report Was Developed

Major material pertaining to Fogarty's role in medical research starts with the Congressional Record of the 81st through the 87th Congresses (1949 through 1962). In preparation for this review all appearances of Fogarty before other committees except for his subcommittee for Labor-HEW appropriations, as well as subcommittee hearings pertaining to the bills calling for a National Institute for International Medical Research, were reviewed.

The author was assisted by the availability of Fogarty's speeches, which were screened for pertinent material by reviewing the abstracts given in An Inventory of the Papers of John E. Fogarty prepared by the archives at Providence College. In all, 25 to 30 speeches were reviewed. Information from about a dozen was particularly informative in regards to Fogarty's views. John E. Fletcher of the Office of Research Information at NIH wrote most of Fogarty's speeches, as indicated by letters with drafts of speeches from Fletcher to Fogarty in the PC papers. This was not true of Fogarty's prepared addresses on the floor of the House. Fogarty and Fletcher were able to have personal meetings, rather than correspond, while Fogarty was in Washington. The archives staff at Providence College was extremely helpful with correlating speeches, bills and prepared addresses to Congress with one another.

Other sources that were useful in gaining information were the proceedings of the NIH First International Symposium on International Biomedical Research held in 1963, the Presidential State of the Union Addresses, and inaugural speeches 1957-64 were useful in getting information relevant to the political context of Fogarty's programs. Audiovisual materials were also identified during the course of the research, the bulk of it being obtained from the Fogarty Collection at Providence College. Other printed materials on Fogarty are available at the RI Historical Society, the *Providence Journal,* the Providence Public Library, and WJAR-TV in Providence, RI.

Special thanks to John A. Sherman, MD, for his assistance with the preliminary preparation of the manuscript. Thomas J. McAndrew, attorney-at-law and Fogarty's son-in-law, kindly reviewed the manuscript and made helpful corrections and additions. Special thanks to Coralie Farlee of the NIH for the opportunity to review the current activities of the Fogarty International Center. Thanks also to Jane Jackson and Matthew Smith, Providence College's archivists, and Susan Diggins, who researched the union and military aspects of Fogarty's early career. The expert secretarial assistance of Judy Fuller is, as always, most appreciated.

Fogarty again turned to his goal of increasing US involvement in international research. This recurring goal of Fogarty this time took life in the form of a line item in the appropriations bill for the NIH for the years 1965 and 1966. He was prepared to reintroduce his legislation again in 1967. This time was to provide funds to establish at NIH a clearinghouse for international researchers and medical scientists. This idea was referred to by Fogarty back in 1963:

> "Instead of a curtailment of the programs and activities of the United States in the field of international health research, I should like to see a plan to bring into being at Bethesda a great international center for research in biology and medicine dedicated to international cooperation and collaboration in the interests of the health of mankind as so boldly envisaged by the president. This center would encompass conference facilities, laboratory and study space, and living quarters to permit the assembly for discussion, study and research of the outstanding health scientists of the world. I

> visualize this center associated with the great facilities of the NIH and the NLM as representing the visible and tangible embodiment of this nation's devotion to the use of science for peaceful purposes and the good of mankind."[70]

The item was cut from the appropriations bills for each of those years. Then, on the first day of Congress, January 10, 1967, Fogarty, who stated he would not want to live through another heart attack if it would leave him incapacitated, died suddenly. He was slumped over a pile of papers relating to legislation he intended to introduce in that session, his brilliant career cut short by a premature coronary thrombosis.

What Was Lost and What Gained?

It is impossible to know what course the development of international health research would have influenced international relations. It is possible, 25 years later, to view the extent to which the current situation shares elements of Fogarty's vision, and also falls short of it. First and foremost, the National Institutes of Health are still clearly the world leader in biomedical research.[71] This is where Fogarty and his NIH colleagues had intended that all the roots of US research involvement be planted.[71a] There remains two main mechanisms for NIH support in international research. There continues to be regular awards of international research grants to foreign institutions and researchers. At the time of the NIH centennial in 1987, NIH funding for international activities included $32 million for foreign research grants and contracts, $27 million to support foreign scientists in the United States, and $1.9 million for US scientists overseas.[71b]

If one considers the levels of funding that Fogarty desired for his program, however, in light of his bill's initially proposed authorization level of $50 million (in 1958 dollars), one must conclude that the current funding levels for this program are quite low (Figure 1). More recently, international research funds have been negatively influenced by balance of payments problems and restrictions preventing the flow of dollar funds abroad. The other main NIH mechanism for international research is the support of foreign scientists here in the US. This is done through a clearinghouse for foreign scientists that was created shortly after Fogarty's death and was christened the John E Fogarty International Center for Advanced Study in the Health Sciences. This is exactly the type of center that Fogarty had tried to establish in the NIH budgets for previous years. Legislation authorizing the FIC was presented by Congressman Melvin Laird, (R-Wisconsin) the ranking minority leader of the appropriations subcommittee before and after Fogarty's death. In the appropriations bill for NIH:

> ". . . the committee has provided funds to plan a lasting memorial to a man who for more than a quarter of a century worked tirelessly for a healthier America in a healthier world".[72]

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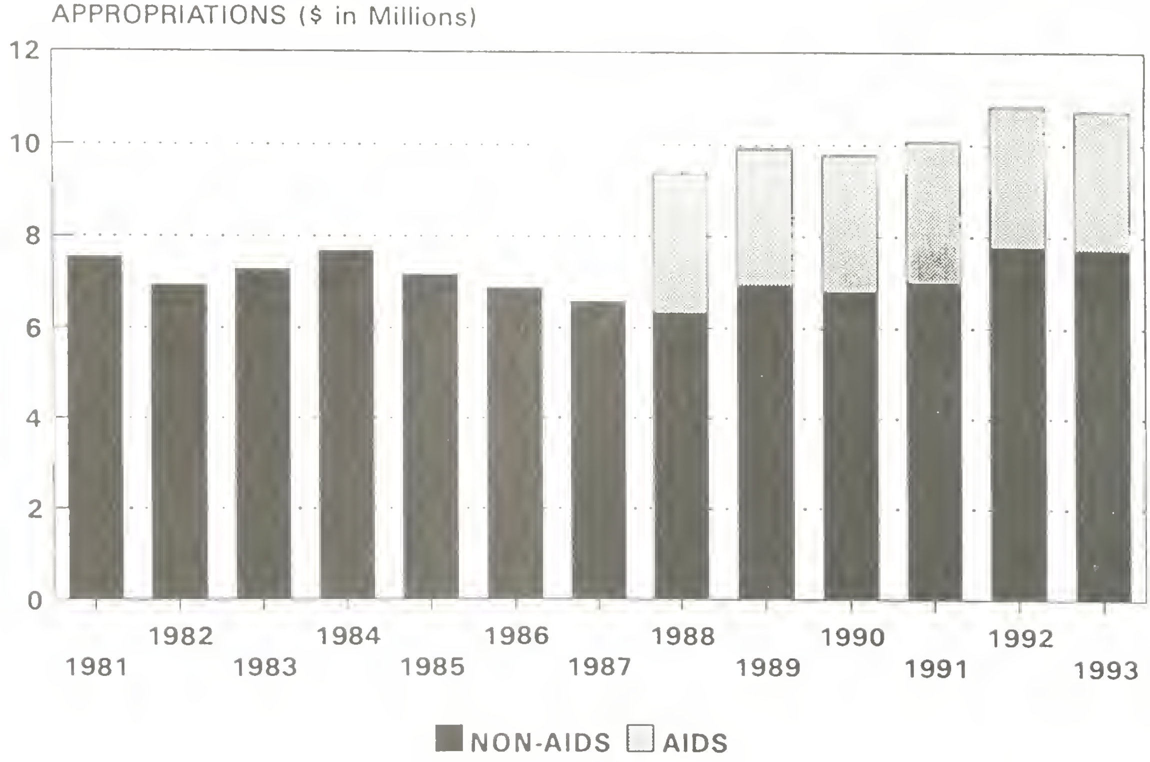
Fig. 1 – **Change in FIC Appropriations FY 1981 - FY 1983 (constant dollars)**



This budget item had been given strong support by President Johnson in his Health Message to Congress:

> "In the 1968 budget . . . I am seeking funds to establish an International Center for Advanced Study in the Health Sciences and to provide scholarships and fellowships in the Center."[73]

The legislation passed and the Fogarty International Center, a focal point of the NIH's international programs, was established. Nevertheless, though NIH funding for foreign projects and the Fogarty International Center provide US involvement in foreign research, one must question whether these programs have brought US involvement to the leadership role Fogarty had intended. The FIC is exactly as Fogarty had planned it when he presented the budgets for 1965, 1966, and 1967, but there is a considerable discrepancy when the programs are juxtaposed to the original International Health Research Act presented in 1958.

In his original bill, Fogarty had outlined an extensive program for research in a designated new institute, training of foreign and domestic researchers in international health, and extramural research within foreign countries. The funding he desired was not just a portion of the general funds, foreign projects being considered with all others, but rather a designated funding level and a review process for specifically international projects. Perhaps most importantly, these two programs lacks specific authority for the Secretary of HEW to act within foreign countries on behalf of world health. That authority, which Fogarty had clearly desired in his bill, became vested in the president by the International Health Research Act of 1960. The president has delegated this authority only three times. Any other effort to authorize HEW to conduct research for world benefit have been essentially nullified by an interagency struggle between the Office of Management and Budget, HEW, and State.[74]

There have been few developments in international research funding outside of the NIH. US officials over the years have expressed US dedication to improving health conditions globally. However, these "often take the form of conceptual presentations and not specific commitments . . ."[75] Some few sincere gestures have been curtailed without much real output. President Johnson's proposed International Health Act of 1966, which centered on hunger and primary care giving no attention to research, did not emerge from the House Rules Committee. Several other proposed acts dealing with international health, such as the proposed International Heath Agency Act of 1971 and the proposed International Health Agency Act of 1975, were attempts to designate a specific authority outside of foreign policy of US involvement in international health, but none got off the drawing board.[76]

In the last analysis it appears that John E. Fogarty's goals as he outlined them from 1958 on, of a specific US authority acting in the primary interest of world health through designated funding of research projects within the US and abroad, have yet to be met. There still exists, however, the potential for both Congress and the Administration to join for this purpose with the medical and international sectors to advance US involvement in world health and medical research.

The same forces that had prevented Fogarty's bill in 1958 and 1959 are equally as potent now: an Administration intent on controlling all international involvement foreign policy, a tight economy, balance of payment problems and a disenchanted electorate. In current dollars, FIC has enjoyed a fairly steady growth in appropriations since FY 1981 for non-AIDS programs, and since 1988 for AIDS programs, except for a relatively flat period from 1984 through 1987. However, in constant dollars which take into account inflation, the proposed budget for non-AIDS programs in 1993 is approximately the same as in 1981 (Figure 1). This indicates a lack of real growth except in AIDS-relating funding.[77] While concessions in the international budget have been made to respond to the AIDS pandemic, the lack of real growth documents the continued difficulty in gaining concessions from American congressional leadership for other aspects of international biomedical research. This is indeed unfortunate because as Fogarty stated so well:

> "The alternative is that the United States . . . will reduce its leadership role in furthering humanitarian programs, and may become more of a responder than a leader."[78]

While his vision of American leadership of international biomedical research is at the moment dim, as the Cold War ends, it is not inconceivable that the next century might yet see the second American Revolution of which Fogarty dreamed. The resources that were once channelled into arming the world may yet be put toward making it the healthier, happier and a more peaceful world that Fogarty envisioned.

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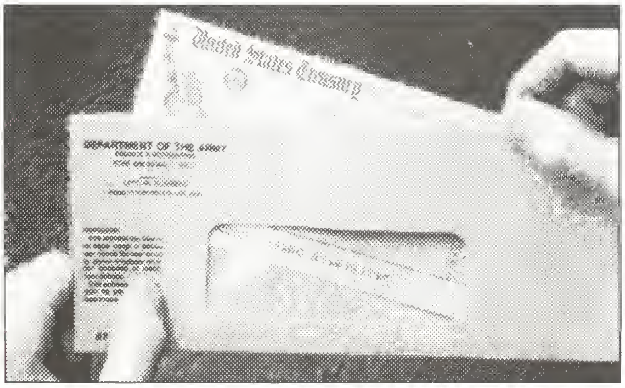

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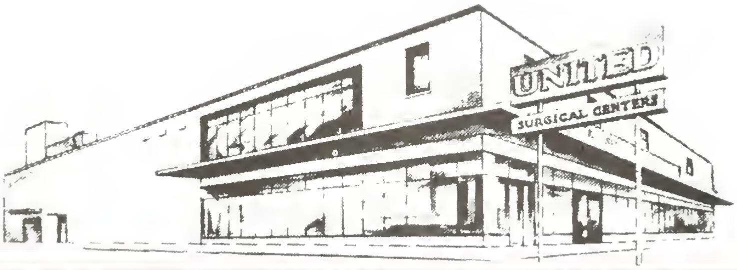

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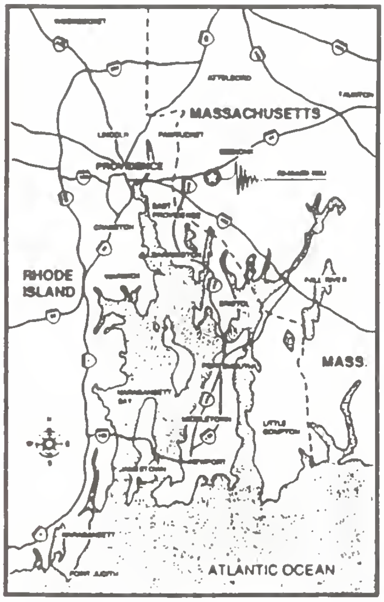

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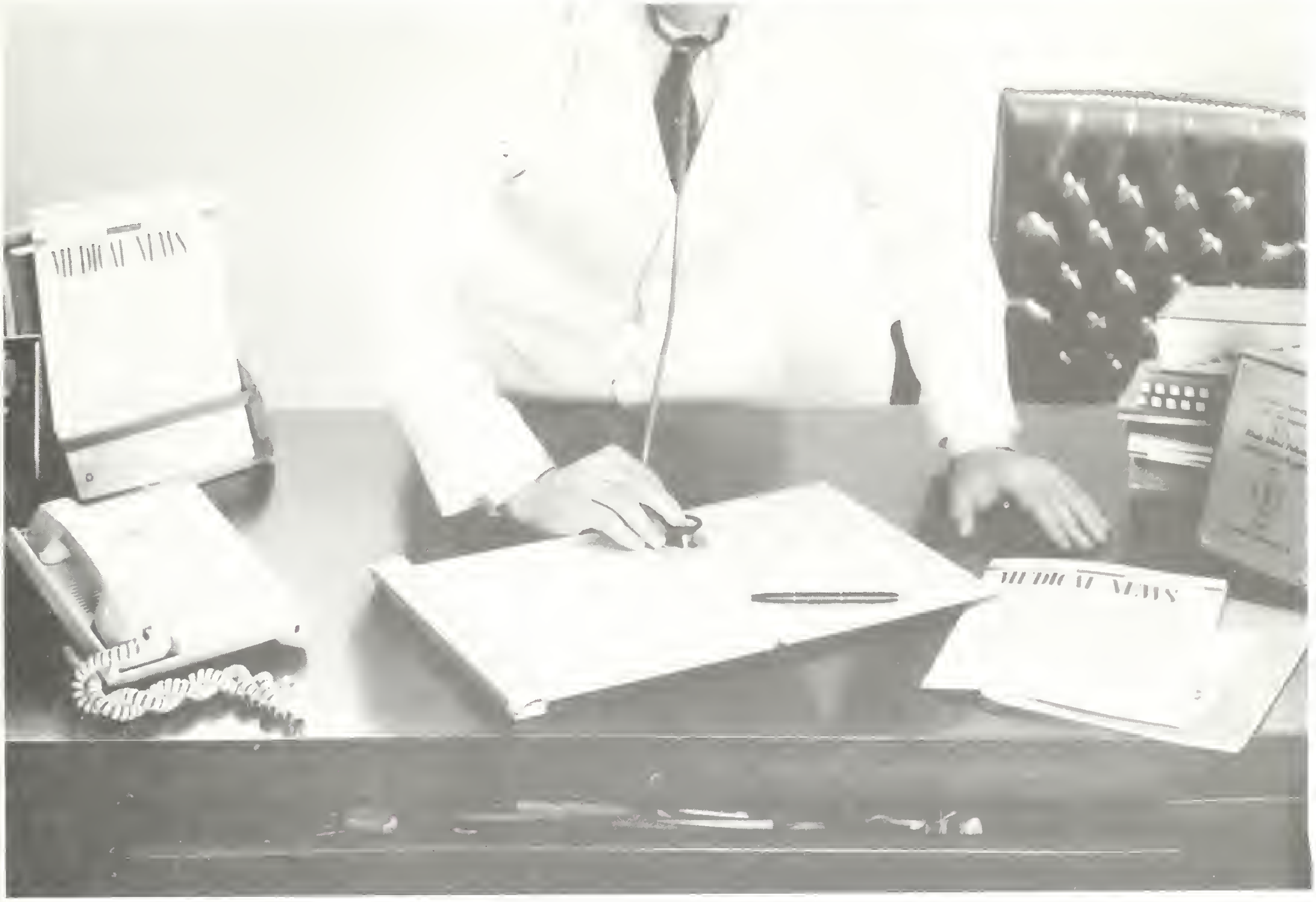

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CHOICES

Ethical & Legal Issues in Medicine

Weighing Community and Individual Needs: Use of Placebos in Clinical Testing

Leo T. Rosenberg, EdD

Pain is pain, joy is joy, everywhere even as in thee.[1]

Josiah Royce

For 27 years, physicians have suspected that folic acid deficiency in pregnant women is a cause of a common series of severe defects in fetal neurological development.[2,3] In 1983, the United Kingdom's Medical Research Council (MRC) sponsored an international study to try to confirm this suspicion and test the efficacy of dietary supplements of the vitamin. Research trials were carried out in seven countries. The protocol for these trials called for randomly providing women who were anticipating becoming pregnant either with a daily folic acid supplement or with placebos. Women who were asked to participate in the study all had a relatively high risk of conceiving babies with a neural tube defect.[4-6]

Publication of the MRC study results in the *Lancet* was not accompanied by adequate description of the reason any woman had agreed to take part in the double-blind testing program. There have been no subsequent discussions of the ethical cost of this manner of testing. When a person is asked to take on severe health risks for the sake of the broad community, when patients at high risk are blind to whether they are receiving an experimental treatment or a placebo, we ask exceptional sacrifice. Possibly we have become too cavalier about asking for such sacrifice, too unwilling to consider alternate protocols for the control of clinical experiments.

This essay challenges the rationale of an experimental protocol in the folic acid study considered at least ethically questionable though the method is widely adopted. Where the risks of physical and psychological damage are substantial, whenever an experimental protocol calls for a double-blind delivery of treatment and a placebo, a critical discussion of the possible efficacy and ethical character of alternate protocols is always in order.

Physicians in the United States have routinely advised women who planned on becoming pregnant or who had recently become pregnant either to take folic acid supplements or a multivitamin formula containing folic acid.[7]

Lauersen had cautioned would-be partners in 1983, that folic acid "is the one vitamin whose increased requirement in pregnancy cannot be satisfied by a balanced intake of foods." The vitamin is vital but difficult to get sufficiently without supplements, or diets rich in dark green vegetables, legumes and whole-wheat products. Excess amounts of the vitamin are harmlessly excreted. Supplements can be taken safely and their cost is low.[8]

> ***Would a male physician wish a woman he loved to be part of such an experiment?***

Clinical tests conducted by Smithells and Laurence in 1980 and 1981 already served as convincing demonstrations that multi-vitamin formulas with folic acid could reduce their incidence of neurological defects significantly.[9-11]

What justification could there then be for studying women at high risk of conceiving babies with neurological defects, women who were not taking any folic acid supplement?

Could there be found a single female physician, at high risk of having a child born with neurological defects, who would agree to be part of this type of experiment, to risk being randomly assigned to a control group and not given a folic acid supplement? Would a male physician wish a woman he loved to be part of such an experiment?

Leo T. Rosenberg, EdD, is a professor of Education, Rhode Island College, and is currently a visiting scholar at the Harvard School of Divinity.

ABBREVIATIONS USED:

MRC: Medical Research Council

Eighteen hundred women were studied. The women already had conceived babies with neurological defects and were at 10 times the normal risk of another such tragic conception. The women were free to choose their own diets; but instead of giving folic acid supplements to all the women, half were not given folic acid. Neither the women who volunteered nor their physicians knew whether they were receiving the vitamin.

Women who were using a vitamin supplement were excluded from the study. Women who volunteered were given initial blood tests to determine folate levels. These blood tests were repeated at the onset of pregnancy, but the results of the tests were not made known to the prime care physicians or the women.

Suppose a woman showed a relatively low level of folate in an initial blood sample? The primary care physician would ordinarily tell the woman and suggest a vitamin supplement. But, neither the physician nor the woman would know folate levels under such a protocol. Again, the women recruited were in a high risk group to begin with. Blind-testing of these high-risk women would seem to present physicians with an impossible ethics problem.

As suspected, 27 women of the control group bore fetuses with neurological defects as against 6 of the women given folic acid supplements. These differences are significant, and there is even more reason than before the conclusion of the MRC study to urge that all women who want to become pregnant take folic acid supplements. But why did any woman included in the study have to suffer the uncertainty as to whether she was receiving the vitamin or the placebo? Why did the women assigned to a control group have to bear such a risk? Why should those who loved the women have need to suffer?

Smithells planned to use a double-blind randomized dose study of the effects of multi-vitamin supplements on neural tube defects in pregnancy. However, in the 1970s there was reason enough for an ethics review committee to ask Smithells to provide vitamin supplements to any woman volunteering for the study who had already experienced a tragic conception.

Smithells' study showed there was a significant benefit from a multi-vitamin regimen. Of course there remained many questions to be answered, for all of the high risk women had been given supplements. Why then could not physicians have been asked to keep uniformly detailed records on pregnancies resulting in neural tube defects, especially to keep records of subsequent attempts at becoming pregnant and conception experiences of women who had conceived a baby with a neural tube defect? The records could have been used as controls in clinical trials in which all of the participants were to be given supplements.[12-15]

Several studies supported the findings of Smithells and Laurence. A study conducted by Mills that does not support the earlier research conclusion had a questionable protocol, based solely upon each woman's recollections of diet. Interviews with women were conducted between 3 and 6 months after neural tube defects had been detected, either when detection came before or after a birth, to determine whether the women had been taking multi-vitamins or a folic acid supplement. Diaries had not been kept, and there were no backup measures of folate levels in the blood before or after a conception.[16-19]

The point of controls is to isolate variables and that can be systematically provided for in different ways. More routine and systematic monitoring and recording of data on patient health characteristics can in itself become a most effective way of preparing a data base for control. Fine record-keeping is expensive, but it is quite an important practice in preventive medicine development.

Research with human subjects ought to be designed with delicately weighed concern for community and care for each of the research participants. Research logic and designs follow not from an abstract ideal of objectivity, but from the mix of sensitivities of researchers and committees on ethical safeguards.[20-23] I wonder whether the concerns in the MRC research were weighed too heavily to the community and too little to the physical or psychological needs of 1,817 pairs of hopeful parents and the lives of their possible infants?

An advantage of the double-blind treatment and placebo protocol in a clinical experiment is the ease, the limited expense, by which bias can be controlled. But if in this way bias is to be eliminated statistically, it may be at a high price for the participants in the experiment. Objectivity in treatment is surely called for in clinical research; however, providing treatment objectively does not mean that physician-researchers have to distance themselves from the immediate needs of patients. Breaking apart the tradition of an open intimacy and hopeful trust in patient-physician relations for blindness, for the chimera of experimental objectivity, has to be questioned.

Though the focus here was on the MRC folic acid study, the questions raised are by no means so narrowly based. As part of the Women's Health Initiative in the United States, a broadly based long-term research study of the effects of vitamin D and calcium supplements in preventing colon and breast cancer and bone fractures in post-menopausal women will begin this year. The clinical research program is to involve some 60,000 women, at least 30,000 of whom will be given placebos for up to 10 years.[24-27]

To realize another's pain as pain is to cease to desire it in itself.[1]

Josiah Royce

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Physical Inactivity Among Rhode Island Adults

Physical activity has been shown to contribute to the prevention of coronary heart disease and the control of hypertension, diabetes, osteoporosis, overweight, and depression. Physical inactivity appears to be an independent risk factor for coronary heart disease.[1] Accordingly, increasing the proportion of people who engage in physical activity has been selected as one of the nation's Year 2000 Health Objectives:

> Objective 1.3: "Increase to at least 30% the proportion of people aged 18 and older and to at least 75% the proportion of children and adolescents aged 6 through 17 who engage regularly, preferably daily, in light to moderate physical activity for at least 30 minutes per day."[1]

The Centers for Disease Control (CDC) characterize persons as sedentary if they perform "no activity or a physical activity ... done for 20 minutes or less, or fewer than three times per week."[2] According to this definition, more than half the adults in the US were characterized as sedentary in 1990 (median percentage among 45 states: 58.1).[3]

In 1991 the Rhode Island Behavioral Risk Factor Surveillance System (BRFSS) conducted telephone interviews with about 1800 randomly selected Rhode Island adults with telephones. Respondents were asked about health-related behaviors and sociodemographics and were characterized as sedentary or not sedentary based on their responses to questions about physical activities.

Similar to other adults in this country, 55% of Rhode Island respondents were characterized as sedentary. . .

Similar to other adults in this country, 55% of Rhode Island respondents were characterized as sedentary, with the highest rate (73%) among persons over 74 years of age (Figure 1). There were no notable differences between males and females for any age group, with the exception of males 18-24 years of age. They had the lowest percentage (39%) reporting a sedentary lifestyle of any age and gender group (Figure 1). People of greater educational attainment and people with higher incomes were less likely than others to lead sedentary lifestyles (Figures 2 and 3).

According to the Year 2000 Health Objectives for the Nation and in response to Rhode Island Executive Order 92 - 15, dated June 26, 1992, the Rhode Island Department of Health will organize, convene, and staff the Governor's Advisory Council on Physical Fitness and Health, to promote physical activity among all Rhode Islanders. On the basis of responses from the Rhode Island BRFSS, the council may wish to target particular age, education, or income groups with special interventions.

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Submitted by Francis A. Donahue and John P. Fulton, Office of Chronic Disease Prevention and Health Promotion. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD.*

Fig. 1 – **Percentage of Rhode Island residents characterized as sedentary, by age and sex.**

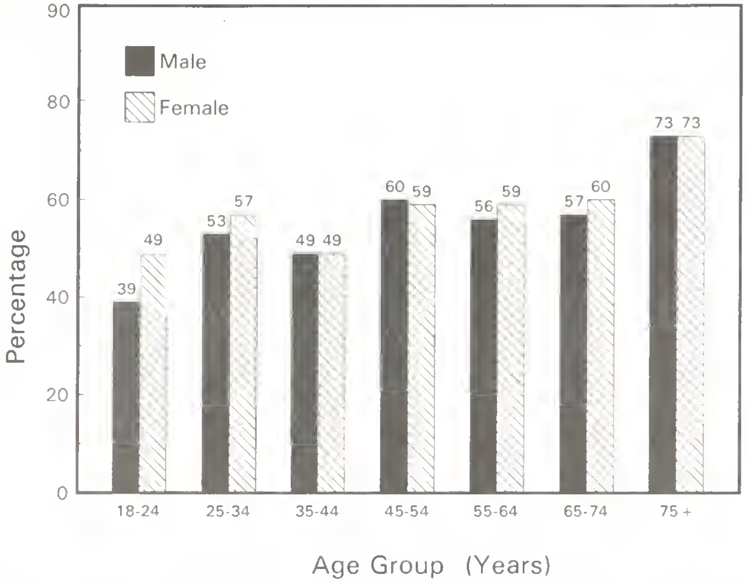


Fig. 2 – **Percentage of Rhode Island residents characterized as sedentary, by education.**

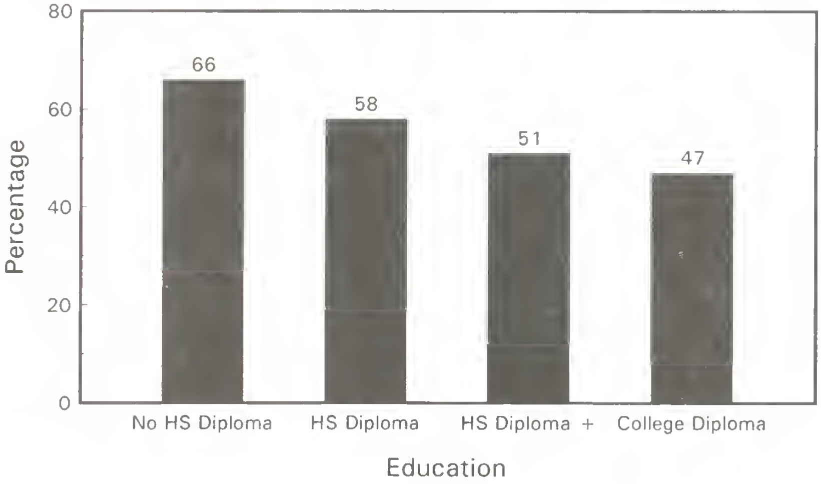
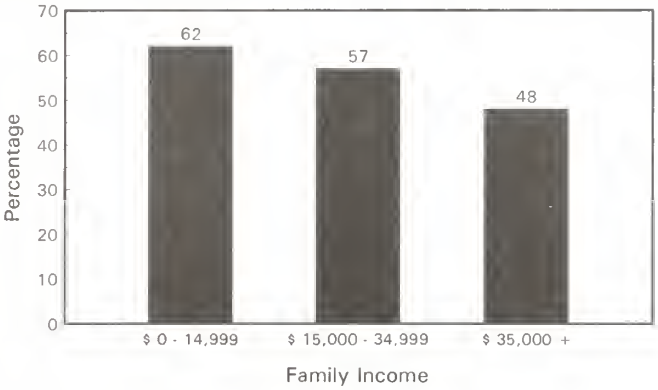


Fig. 3 – **Percentage of Rhode Island residents characterized as sedentary, by family income.**



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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

Ninety Years Ago (December, 1902)

George F. Keene, MD, paraphrasing his annual address before the Rhode Island Medical Society, writes on human heredity and its lessons. "Whatever man may be," he writes, "is the product of the sum total of what he has been, into the sum total of what he is differentiated by the accidents of environment. The individual is transitory; the race alone is permanent."

In considering the deep hostility between "the defenders of the Pentateuch and the disciples of Darwin" he states that he sees no ungodliness in the doctrine of evolution. In considering the morphological proofs of evolution, he notes that our anatomy betrays our ancestry and our embryology confirms it. Darwinism, he states, contends that life is a struggle for existence and that evolution of the species is accomplished under stress.

And yet, he believes, there is, there must be, something, some substance transmitted from parent to offspring in the animal composed of multiple cells. "Nothing new is produced or reproduced." He quotes Darwin to explain the phenomenon of heredity (pangenesis): "Every cell of a living organism contains and will give off, under favorable conditions, minute invisible granules or atoms which possess in themselves the potential of the cells, or the power to develop into or reproduce cells similar to those in which they exist." Darwin called such elements, gemmules. (Ed. Note: Darwin uses this word first in 1871, in his text, Descent of Man. The word gene, representing a unit of heredity, is not used for another eight decades.) No totally new organism, in the view of the author, is therefore possible. He quotes an old postulate of science, *ex nihilo nihil fit* (from nothing, nothing is made.)

The author then discusses the alleged problem of "the accumulating human defectives and degenerates . . . which seemingly threaten the integrity of the race." He does not readily accept the notion that restriction of marriage and "asexualization" of certain degenerates will alter anything. Legislation without education, he contends, is futile and inoperative. He concludes: "Let us not forget that within each mortal body there is a center of immortality which makes for the continuity of the race; we each contribute to it, but no one can ever destroy it, hence it lives on and on, the potentiality of generations yet unborn. It is not degeneracy, it is not involution; these are but the eccentricities of evolution, these are but the inevitable sequences of circumstance, and nothing can be built without waste, nothing will stay the hand of Nature whose immutable laws know nothing of extenuating circumstance."

W. Louis Chapman, MD, offers a learned paper on the etiology of endocarditis, concerning himself with those prior conditions that directly predispose or immediately lead to endocarditis. He notes, in general, that overwork, mental anxiety and excessive nitrogenous diet are productive of much harm to the heart. Endocarditis is mainly a disease secondary to some preexisting circumstance – and may either be infectious or non-infectious. Acute, articular rheumatism remains the commonest cause of endocarditis, in Osler's judgment accounting for 58.1% of cases. The author also quotes Osler on the commonness of warty valvular vegetations in patients with chorea. Alcoholism is stated to be a major cause of endocarditis. Malignant, ulcerative or septic endocarditis is a progressive and fatal disease with no single, specific etiologic agent. In general, therapy for endocarditis consists largely of ": . . . rest both of mind and body" and the judicious use of "depresso-motor drugs."

Albert H. Miller, MD (later to become Editor-in-Chief of the *Rhode Island Medical Journal*) writes a paper discussing post-operative mortality with especial reference to death ascribable to anesthetics. During the year 1901, in Providence, the author states that there were seven deaths due to the administration of anesthetic. (During this same year, there were 2,500 surgical operations requiring anesthetics. Obstetrical use of anesthetics were not included in these data.) In this population of 2,500, 89 (3.6%) died postoperatively. In analyzing those specific deaths that appear to be secondary to the administration of ether, Miller states that the remedy lies in an appreciation by the anesthetist of the dangers of overdosage. He urges, too, that anesthesiology should be taught in medical schools. He concludes: "To relieve pain and prolong life, these are the aims of medicine, and anesthesia during its short 50 years of existence has not been the least of the means of producing these results."

Fifty Years Ago (December, 1942)

The lead article is written by Henry E. Utter, MD, who discusses the fears of infants and young children as encountered in the practice of pediatrics, noting how common are these apprehensions and how deep-rooted they are in the subconscious that they may at times become obsessive and may even dominate the existence of some children. After a consideration of inherited fears, protective fears, convenient fears, and conditioned fears he concludes: "Regularity in the daily routine for the young child, proper food and above all, sufficient and regular hours of rest are of utmost importance in the development of a stable nervous system. Every conditioned fear has a well-defined basis for its appearance. A clever mother should be able to unravel the threads leading up to the situation which lowered the threshold of the child's subconsciousness to permit the entrance of the fear complex. The fears of older children may need a trained detective to reveal their basic causes; the mother should be the best physician for the young child."

At the invitation of the editors of the *Journal*, J. Walter Wilson, PhD (associate professor of Biology at Brown University) writes on premedical education during wartime, particularly with the lowering of the draft age. "In my opinion," he observes, "the most important thing for a premedical man to do in college is to learn to think as a scientist and, the next most important, to build up a scaffolding of general scientific knowledge in which to construct the edifice of specific detail he will have crammed into him in medical school."

The principal editorial addresses the dangers in socializing medicine, particularly during times of war, noting that if " . . . health is to be considered a "democratic right" then it should be obtained by democratic means not by regimentation of one part of the community for required services to the rest. Free enterprise, for which we are fighting, applies to doctors as to all others."

Twenty-Five Years Ago (December, 1967)

The lead article is written by Mary D. Lekas, MD, and is a report of an adult case of acute epiglottis. The patient was a 39-year-old male with complaints of a sore throat and difficulty in swallowing. After a number of emergency room visits, indirect laryngoscopy was finally performed revealing a swollen, inflamed epiglottis and a life-saving tracheotomy was then performed. The patient was discharged in 7 days. The author notes that this disease is often fatal if not recognized immediately. The causative organism is usually *Hemophilus influenzae B.*

Eric Denhoff, MD, and Henry M. Litchman, MD, discuss the differential diagnosis of delayed walking (ie, beyond 20 months) and the investigative measures which should be undertaken in such cases. The following categories must be considered: maturational lag; neuromotor impairment; cerebral palsy with mental retardation; and intrinsic myopathies.

William F. Garrahan, MD, writes on the incidence of injuries in high school football players, noting on average that 1 in 5 participants will be injured each year, but only 1 in 13 seriously injured.

The famous legal controversy between Rhode Island's Governor Arthur Fenner and Judge John Dorrance concerning a corpse allegedly sold to Dr. Pardon Bowen for purposes of dissection (in the year 1801) is reviewed in some detail.

The lead editorial decries the tragic toll of highway deaths associated with high blood alcohol in the United States and particularly the various evasions of the law. Another editorial describes the great diagnostic value of muscle biopsy.

Yet another editorial considers the serious difficulties faced by the state of Rhode Island in trying to recruit a comeptent medical examiner. The Attorney General of the State, in the face of an urgent need for such a person, recommended the following four changes: 1) Elimination of the present $15,000 statutory salary limit; 2) Elimination of the statutory requirement of one year of medico-legal training; 3) Reduction in the number of county medical examiners, resulting in higher salaries for the reduced staff; and 4) Establishment of the post of assistant medical examiner.

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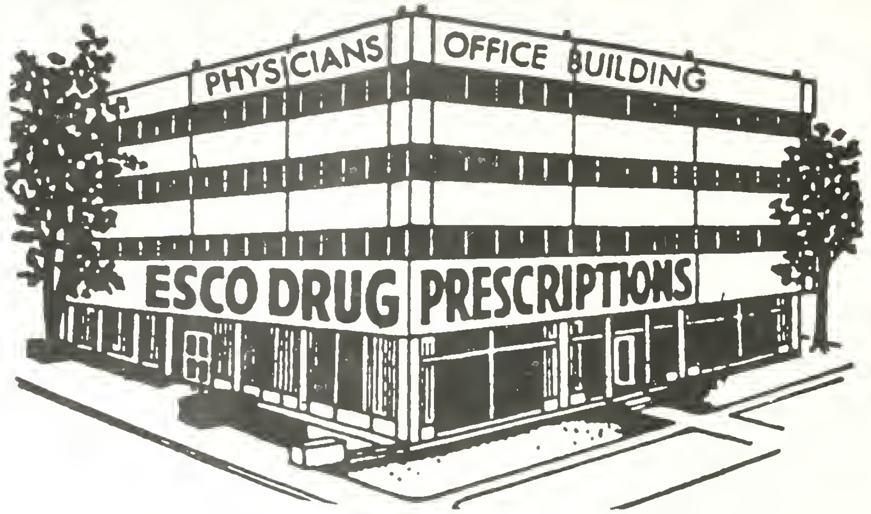

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